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Wood's Rock Drilling Machine.

THE illustration which we make in this issue of WOOD'S Rock Drilling Machine represents a tool which possesses many points of excellence. That it is a difficult invention to perfect and bring into use is a truth that all who have had any experience in the task, are perfectly satisfied of. Professor WOOD began his experiments, several years ago, while he was connected with the University of Michigan, and has made slow but steady progress in the invention to the present time. Since his connection with the Stevens Institute of Technology, he has pushed the work more vigorously, and we are now able to present the results of his labors. As an instance of his laborious industry, it may not be improper for us to state, that whilst this invention has been in progress he has attended to his professional duties, has published two books—one on the strength of materials, and the other on the construction of bridges and roofs, and has now in contemplation a work on mechanics.

WOOD'S ROCK DRILLING MACHINE.

The greatest difficulty which the inventor of a rock drill has to contend with is the *breakage*. At Mount Cenis, one report says, eighty machines were kept

on hand, in order to keep nine running—all the others being in the repair shop. At Hoosac Tunnel, one of the earlier reports states, that "Gradually they began to fail in strength, the incessant and rapid blows—counted by millions—to which they are subjected, appearing to granulate or disintegrate portions of the metal composing them." More recently, however, machines have been in use which are much more durable, so far as certain portions of the machine are concerned. The first and evident remedy is to make them heavy by putting in more iron; but this is not a sure preventive for all the breaks. If the working parts are subjected to impact or shock, in operating them, the heavier they are the more damage they may do to the machine in their movements. The working parts of a modern sewing machine are small and compact, and they perform their movements by the million without breaking. On the other hand, it is not safe to make the working parts too small in this class of machinery, since they may be subjected to severe strains in operating the machine, aside from any shock to which they may be subjected. The sure remedy in all cases where it can be done is to operate the devices without shock. When this cannot be done we only approximate to good results by operating the device by a glancing blow. It is well known that repeated blows, struck square across a piece of iron, will break it much quicker than if the piece be struck obliquely. This latter principle is observed in all successful rock drills.

In order to be efficient, the blows must be rapid, and yet it is possible to err in this direction. A drilling machine has recently been advertised in England, which it is stated will make 1,000 blows per minute, but for which it is not claimed that it will drill faster than others in the market. Such rapid movements necessarily wear the parts much quicker than more moderate ones. The shock on the machine, due to the percussive effect of the blow, will not be as great for each blow as for one of slower movement, doing the same amount of work; but the effect on all the working parts will be more severe, and yet they advertise that duplicated parts are unnecessary!

The working parts may be so arranged and operated that, to *be durable*, the machine must *necessarily* be heavy. But excessive weight, in many cases, makes

them so far nonportable as to be impracticable. There is a large amount of work, such as drifting in mines, stoping, and certain kinds of quarry work, in which a machine to be profitably used, must be managed by two or three men. Such a machine is Prof. WOOD'S three-inch drill, described below. Under favorable circumstances, such as drilling on a horizontal ledge, a single man can manage it. But there is a large amount of work in which a heavy machine is much more economical, such as making holes from three to five inches in diameter and several feet deep. For such work durability is the most desirable feature.

The several sizes of this drill are made after the same general style, so that a description of one will answer for all. One of the most essential requirements of a steam drilling machine is the valve gear. The valve should be so operated as to secure a blow upon the rock at the forward end of the stroke, and arrest the back movement of the piston without striking the rear head. In this drill the valve is just under A. It is operated without the least shock upon any part of it, and hence removes the chief cause of breakage of this part in other machine drills. The main valve is not reversed until the blow is struck, thereby securing the full force of the motor in producing the blow. In those machines which reverse the valve before the blow is struck the blow is in a measure eased up, or cushioned. In such cases a more severe blow would be produced by a shorter stroke. The stem *A*, Figure 1, is for adjusting the length of the stroke. By turning it right-handed, the stroke may be shortened and by turning it sufficiently it may be stopped at the end of the forward stroke. Similarly by turning it to the left, it will stop at the rear end of the stroke. This adjustment may be made instantly, when the machine is running at any speed. As it has no head center, it is always ready to start when steam is let on if the valve is properly set, and if it does not start the operator turns the stem. Another interesting feature is, if the piston is driven too far in the cylinder, tending to strike the forward head, the machine stops itself; and if it should strike the head once it will remain there. In most other rock-drills, if the drill-shank breaks, the piston will strike the forward head repeatedly until steam is cut off or until it breaks the machine, Notwithstanding these peculiarities the motion of the valve is not delicate, so that if there are irregularities in the feed—a thing which is unnecessary in this machine—the valve will continue its motion.

The rotation of the drill is performed by a single click which is contained in the rotation-box B, and which operates directly upon the piston rod. It is thus simple in its construction, and in order to give it slight elasticity and prevent breakage, it is backed with a block of rubber which is contained in the box B. It is rotated during the back stroke, and is firm during the forward stroke. If a steam rock drill has a good valve-gear and a sure rotation, it will drill provided the tool is fastened securely to the piston rod. At first thought it would seem to be a simple matter to attach the tool to the piston rod, but experience has shown that it is exceedingly difficult. Attempts have been made to fasten it with a union coupling, with keys, with set screws inserted into the side of the rod, but in all these cases the jar due to the concussion of the blow loosens the nuts, screws, or keys, and thus lets the drill loose. Some devices have been successful for a time, in which there was slight elasticity in the parts. In this machine the tool is seized automatically, and has no screws or bolts about the device. The drill shank E is inserted into the space between the conical wedges D, which are inserted into the chuck C. The drill may be inserted loosely, and when it strikes the rock, it suddenly stops the advance of the piston, and the wedges "chuck" forward and seize and hold the drill. The drill is easily and quickly loosened by driving the wedges back.

The feed shown in the cut is a hand feed. Mechanics often say that a hand feed is not as true and efficient as an automatic feed, but in this they are mistaken, if the feed has a positive regulator. In this machine there is a click on the back head (not seen in the cut) which prevents an advance feed when it is in bearing, but when the piston advances beyond its proper place, it disengages the click and permits an advance feed. By this arrangement the operator has only to press upon the crank F and turn it as often and as far as the machine will permit. If the rock is hard and cutting slow he will be *obliged* to turn the crank slowly, but if the cutting is rapid he may turn the crank rapidly, and if he does not turn it fast enough the drill will stop and remain until it is properly fed forward. An automatic feed is added so that the operator can take his choice, as one does not interfere with the other. For outside work the machine is mounted on an adjustable tripod as shown in the cut.

For drifting in mines, a column is used as shown in Figure 2, which shows a machine in actual operation, as it was used in drifting in an iron mine. This is made of hollow pipe, the novel features being the self-adjustable clamp at one end, so as to adapt it to uneven rock, and the jack-screw at the other. When the heading is not over six or seven feet wide, the column may be placed horizontal, as shown in the figure. In many cases the column may be placed vertically, or inclined. A column thus constructed for a three-inch or a four-inch drill can be carried by a single man. There are many cases in stoping in which a long column may be used and a series of holes made by beginning at the upper end of the column and, after drilling a hole, moving the machine down the proper distance and clamping it, and so on. The three-inch drill, which weighs 190 pounds and carries inch or inch-and-an-eighth steel, is especially adapted to this kind of work. Its rate of drilling, under favorable circumstances, is almost incredible, considering the capacity of the machine. In a block of Quincy granite in Mr. CHURCH'S yard, in Newark, N. J., a hole 1½ inches in diameter was drilled 11¼ inches deep in 2½ minutes, or at the rate of 4½ inches per minute. In a trial, at Pittsburgh, the same size hole was drilled at the rate of 12 inches per minute in sandstone. In Mr. TRUESDELL'S limestone quarry, where he has been using one of these machines for six months, he states that it will do the work of twelve men.

This machine promises good results for a great variety of work.

A smaller drill, called the 2½-inch drill, will weigh, including tripod, about 120 lb., and is intended for making plug-and-feather holes in quarries and stone-yards, gadding holes and block holes.

The 4-inch and the 5-inch machines are intended for heavy work. The former weighs 375 pounds, exclusive of the tripod, and the latter 625 pounds.

Further information may be obtained of Prof. DE VOLSON WOOD, Hobcken, N. J.

Coal and Ore Weighing Machine.

A MACHINE for weighing coal has been lately patented in England, which has one good feature. Instead of having a movable pointer directed toward fixed figures to indicate the weight, the figures are carried on a revolving disc, which moves behind a screen. This disc is revolved by the short arm of the scale beam and the weight is read off by the proper figures showing through an opening in the screen, as usual in such arrangements. This mode of reading numerals has become very fashionable among the English who make clocks and all similar forms of indicators in this style. Continuous work at such a machine is found to be much less fatiguing to the eye, than the exertion of following a pointer. In other respects the machine spoken of is a novelty. It is a spring balance, but the parts show some unusual features in arrangement. The spring presses down the

long arm of a lever, while the platform is hung to the short arm. The machine is intended to give the *net* weight. To do this the lever is graduated and a sliding weight is moved along it until the figure corresponding to the average tare is marked, then the dial indicates only the weight in excess of this, or the net weight. The dials are generally graduated up to 15 cwt., by ¼ cwt., and the taring steelyard is graduated to 5 cwt., as these divisions are found sufficient and very convenient in practice. But other graduations of the dial can be substituted, from 7 lb. up to 2 tons, and the margin for taring can be increased to, say, 10 cwt. The self-indicating apparatus may be placed in an office, at almost any distance from the machine, and the indicators of several machines on the same pit bank can be brought into one office, so as to reduce the number of clerks required. For instance, three dials, worked by three different machines, combined and mounted on one ornamental stand, form an invaluable addition to colliery plant, where large outputs require to be registered with exactness and despatch. That these machines give great satisfaction may be inferred from the fact, stated by the *Colliery Guardian* that, although the apparatus has been so recently brought out, over two hundred are now in use.

American Institute of Mining Engineers.

REGULAR FEBRUARY MEETING HELD IN NEW YORK, FEBRUARY 24, 1874.

The Institute assembled in the rooms of the Geographical Society, Cooper Union, at 8 o'clock P. M.

The meeting was called to order by the President, R. W. RAYMOND, who introduced President BARNARD of Columbia College.

Dr. BARNARD welcomed the members of the institute in the name of the City of New York. He esteemed it, he said, a great honor that he should be invited to act in the capacity assigned him. He was at a loss to account for the selection, but perhaps one reason was to be found in the fact that for some ten years past he had been engaged at the business of making mining engineers himself, although he had not the honor to belong to the class. It struck him as a little singular that there should exist a power of creating functionaries, or empowering men to perform certain functions which the person conferring such power was not legally permitted to perform himself. There seemed to be in this something like a paradox—a contradiction of the proposition *creaturam creatori superiorem esse, naturæ rerum non constat*, or in other words, of the proposition, that the creature cannot be superior to the Creator. Yet it often happened to men to give to others offices that they could not fill themselves. So it occurred in his case that he had the occasion to make the beginnings of engineers, while the continuation, the development, the growth and ultimate power, rested with themselves. Thus it was that he often encountered members of the profession whom he had earlier known, so changed that he would scarcely recognize the callow fledglings whom he had aided to take their first flight from the parent nest. His present duty was, he said, simply to bid welcome to the Institute of Engineers. He had been called upon to perform it while immersed in absorbing occupations, and he had accepted, with the understanding that no elaborate address should be required of him. Before sitting down, however, he wished to make two remarks in regard to the profession of his audience, and to some slight extent to illustrate them. In the first place, this profession, in its very existence, was one of the most characteristic fruits, and one of the most significant evidences, of an advanced civilization; and, in the second place, it was one of the most efficient instrumentalities of promoting the advancement of civilization. The science of mining was in every respect characteristic of advancement. The earliest era was the stone age, when men were without metals, and when they were very little better, so far as art was concerned, than savages, who did not go below the surface to seek for the treasures of the earth. Then came the bronze age, when men had found metals in their native state, as, for instance, copper. The condition of the people was then lifted above those of the stone period. Then came the iron age, which was a manifest advance on the bronze period, although at that time they had not iron in the manufactured condition which belongs to an advanced civilization. After the iron age came the age of steel, although it was not so denominated. The principal use of steel then was to make swords and implements of warfare, but now its principal use was to increase the comfort and happiness of the people. If people observed the progress of civilization since history began, they would observe that nothing so kept pace with advancement as the number of uses to which metals were put. CHEVALIER has remarked that civilization was impossible till men learned to cultivate the cereal grains. Or, employing a felicitous personification to enforce his idea, he says that civilization first presented herself on earth as Ceres, holding in her hand a spear of wheat; but it was his own opinion that the cereals had not been so cultivated as to be characteristic of civilization until iron had been brought pretty well into use. It would destroy the poetry, but come much nearer the truth, to say that civilization first appeared in the form of VULCAN, holding a red-hot bloom in a pair of tongs. The profession of the mining engineer is therefore eminently characteristic of an advanced civilization, and is itself a product of civilization. But by its reaction on the civilization which produced it, it is in its turn a powerful instrument for accelerating the advancement of the same civilization. Though the profession deals with all forms of mineral wealth, one of its most important objects is to put metals into the hands of metallurgists with the view of having them applied to the development of the productive arts, in the hands of those who could use them skillfully. In this way their efforts became powerful in the development of civilization. Civilization was an extremely complex idea, involving numerous distinct elements. It might imply intellectual or moral or material culture, and under each of these divisions there might be indicated a variety of subordinate ramifications. Under the intellectual, for example, we may have an æsthetic, a scientific, or a purely literary culture; and under the material, a development of the arts which promote men's comfort, or of those which contribute to satisfy the cravings of luxury. Civilization may advance on all these lines at once, or only upon one or two. History furnishes striking examples of these various modes of advancement. No one cause can operate with equal force on all these lines. The profession of the mining engineer promotes material advancement, but it promotes intellectual advancement also. It is the product of the application of science to the practical methods of accomplishing important results; and it stimulates in turn the growth of the sciences by which it has been created. The Institute of Mining Engineers had a noble work before it. What they accomplished was professional, but in its accomplishment they were helping along, most potently, progress and civilization. In conclusion, he again welcomed the members of the Institute in the name of the City of New York.

MR. RAYMOND'S REPLY.

GENTLEMEN OF THE INSTITUTE—In those far-off days when we went to school and studied the tongues now half forgotten by us, such as Latin and Greek, we learned how ALEXANDER, pausing on the farthest confines of the habitable world, wept for other worlds to conquer. Perhaps our honored friend, Dr. BARNARD, has never in his life been compared to ALEXANDER THE GREAT, but his remark that he sometimes feels a touch of envy as he confers upon young mining engineers the degree which he has himself no right to wear, irresistibly calls before my mind the picture of one who has conquered already the titles of S. T. D., LL.D., and I know not what other symbols of cyclopedic attainment, looking with longing eyes upon the mystery of E. M. as upon an unknown land, not yet subdued. In truth, if there remains in all the range of science and of literature an honorable title which he does not yet wear, it is merely because he has not seen fit to stretch out his hand and take it. He has told us that he is in the business of making our sort of men, so far as special preparatory training can constitute mining engineers. We might fairly reply that we are in the business of making, from materials so prepared, this sort of men; that is, of adding to the culture derived from study and books the larger training which comes by personal observation and practice, and by much contact with men and with affairs. In a word, although we are an association of specialists, it is our aim to be also a company of active, many-sided, comprehensive, mature and judicious men, contributors to science, as well as disciples of it.

I cannot but feel that the constitution of our Society and its whole history to the present time have been a series of happy accidents. We have stumbled upon the very measures which redeem us from narrowness and indolent self-satisfaction, and which give to our intercourse the charm of perpetual and instructive progress. The Institute, under the name of the professions of Mining engineering and Metallurgy, comprises not merely a single specialty, or two specialties, but a group of science and arts intimately connected with almost every physical force and law; and each of us, however well posted in his own particular department, is both interested and profited by the free communication of knowledge from his brethren in other departments. So far from being an element of weakness in the Institute, the fact that it is devoted to all branches of mining and metallurgy, instead of one or two, is the secret of its extraordinary vigor and progress. These remarks are particularly appropriate to the events which have occurred since our last meeting, in connection with the invitation extended by this Institute to the British Iron and Steel Institute, to hold a meeting with us in America. I have recently received, from the Secretary of that body, the information that the proposed visit must be postponed, since a careful canvass of their members has shown that the number of them who can leave their business for such a purpose during the present year is not sufficient to justify the undertaking. Many of them are looking forward to a visit to America in the year 1876, in connection with the Centennial Exposition, and they naturally fear lest their absence from home this year might make it impracticable to come again so soon. We cannot but regret this decision while we appreciate the feelings which prompt it, and recognize with pleasure the courteous terms in which it is conveyed.

In connection with this subject, there has been considerable talk about the position assumed by this Institute in extending the invitation referred to. I am happy to say that the American Iron and Steel Association have recognized, as well as very handsomely endorsed, our action, and offered, most liberally, to cooperate with us in the reception of our expected guests; and I need hardly say that this overture was received and reciprocated on our part in the same friendly spirit as inspired it. But there has seemed to be, in the minds of many persons, a vague notion that the American Institute of Mining Engineers is not strictly the counterpart of the British Iron and Steel Institute, and that its action in inviting that body, and thereby assuming to represent the arts of iron and steel manufacture in this country, was justifiable only because there unfortunately did not exist in the United States any society exclusively devoted to the metallurgy of iron and steel. This is a proposition which we cannot for a moment accept. While we acknowledge audibly and without reservation the importance and the usefulness of the various associations of iron and steel manufacturers, now chiefly united in one association, we cannot cease to believe that the proper body to represent the international interests of those industries, must be one which ignores the questions of local trade and devotes itself to the deeper and wider principles which underlie the manufacture itself in every country—in other words, a body which regards foreign manufacturers solely as co-laborers, and not as rivals, ex-

cept in the generous emulation of scientific progress. To say that we do not adequately represent the metallurgy of iron and steel in this respect, simply because we represent, also, other branches of mining and metallurgy, would be as illogical as to say that Dr. BARNARD is not an eminent and representative microscopist because, besides being master of that department in science, he is master of so many others. The true test in this case is the test of achievement and results; and we may fairly challenge a comparison between the contributions made during the last three years by this Institute to the science of metallurgy of iron and steel, and those which have proceeded from any special iron and steel association, during the same period, in this country or in the world. In short, we are doing for the United States exactly what the Iron and Steel Institute of Great Britain has done so signally for that kingdom. We are in our plans and aims, and to a not unsatisfactory extent in the results already accomplished, what they are—*only more so.* That is, we are trying to do in several directions what they have done in one, and we feel convinced that our efficiency in that one direction is not diminished, but rather increased, by the breadth of our foundations and the multiplicity of our activity. For we are not, like the mouth of the Mississippi or the Nile, a great river shallowing its channel and wasting its force by splitting into many insignificant streams, but rather like many streams, bringing their contributions to swell the tide of a great river. In my humble opinion the Iron and Steel Institute of Great Britain itself could not do better than to open its doors to the representatives of all branches of mining and metallurgy. I think it would find that much light would be thrown from time to time upon great questions involved in its present specialty even by men who happen to be concerned in the manufacture of copper, lead or tin. At all events, such a consolidation of allied arts, though it might be open in that country to the objections arising from the great extent of these industries, rendering it, perhaps, inconvenient to unite their representatives in one body, is open to no such objection here. The arts of mining and metallurgy among us have common interests which need representation, and a common weakness in scientific direction, which requires the support and the remedy to be obtained from a single strong society. This is our *raison d'être;* and so long as we fulfil this function the American Institute of Mining Engineers will be a name of national and international significance and power.

The President then presented the following names to the Institute, endorsed by the Council, for election as members and associates of the Institute.

The gentlemen named were unanimously elected. [The following list includes all new members elected at the various sessions of the meeting. They are assembled here for convenience].

WM. H. WAHL, Franklin Institute, Philadelphia.
RICHARD PRESCOTT, Albany, N. Y.
M. D. BURKE, N. E. corner Third and Walnut, Cincinnati, O.
WALTER PROCTOR JENNEY, 169 Laffets street, Brooklyn.
FRANK B. JENNEY, 169 Laffets street, Brooklyn.
JOS. R. SHIMER, Easton, Pa.
Prof. C. A. SCHAEFFER, Cornell University, Ithaca.
C. B. DAHLGREN, 236 W. Baltic street, Brooklyn, (Mazatlan, Mexico).
H. L. FULLER, Woodside, Luzerne Co., Pa.
Prof. CHAS. P. WILLIAMS, School of Mines, Rolla, Mo.
ARTHUR F. WENDT, 92 Broadway, N. Y.
E. F. KITTOE, Oak Point Mines, Charleston, S. C.
W. H. SCHÖNBERGER, Pittsburgh, Pa.
M. W. BURT, Wheeling, West Va.
MORRIS BEST, St. Johns, New Brunswick.
FRANK J. HEARNE, Wheeling, West Va.
JAMES DOUGLAS, JR., Quebec, Canada.
MORRIS P. JANNEY, Pottstown, Pa.
EDWARD COOPER, 8 Lexington Avenue, New York.
Prof. J. E. CLAYTON, Box 599, Salt Lake City.
A. V. WEISE, Box 1096, Salt Lake City.
JOS. M. LOCKE, Cincinnati, O.
LEONARD R. ROOT, Cincinnati, O.
ADOLPH WINTER, Mexico.
CLARENCE KING, 47 Lafayette place, N. Y.
HENRY A. VEZIN, Philadelphia (Empire, Colorado.)
J. A. PORTER, Eureka, Nevada.
WALTER McDERMOTT, Silver Islet, Thunder Bay, Ontario, Canada.
Capt. C. E. DUTTON, Washington Arsenal, Washington, D. C.
R. W. HUNT, Bessemer Works, Troy.
C. A. COLTON, School of Mines, N. Y.
A. HARNICKEL, 22 Cliff street, N. Y.
M. F. MAURY, Charleston, Kanawha Co., W. Va.
JOSEPH POTTS, Treasure City, Nevada.
E. F. EURICH, 20 East Eleventh street, N. Y.
EDWIN J. HULBERT, Houghton, Mich.
F. J. SLADE, Trenton, N. J.
PHILLIP W. MILLER, 43 Exchange Place, N. Y.
FREDERICK A. CANFIELD, Dover, N. J.
ARCHIBALD McMARTIN, Wilson Steel Works, Providence, R. I.
D. ERNEST MELLISS, 52 Broadway, N. Y.
ISAAC NEWTON, 31 East Seventeenth street, N. Y.
SAMUEL W. HILL, Marshall, Mich.
ROBERT LAWRENCE, School of Mines, N. Y.
H. STEWART, " "
S. HAMILTON, JR., " "
M. IHLSENG, " "
B. T. PUTNAM, " "
C. M. WALKER, " "
J. G. M. CAMERON, " "
D. A JOY, " "
E. E. OLCOTT, " "
HENRY McCORMICK, Harrisburgh, Pa.
CHAS. O. PARSONS, Pennsylvania Steel Works, South 5th street, Phila.
HENRI ISELIN, New York.
P. L. BURTHE, Paris, France.
H. AMIOT, " "
M. C. BULLOCK, New York.
Prof. GEO. H. COOKE, New Brunswick, N. J.
Prof. C. F. CHANDLER, School of Mines, New York.

The President then called for a paper, by Mr. A. L. HOLLEY, on recent improvements in Bessemer Practice, after the delivery of which the meeting adjourned. Mr. HOLLEY's paper will be published as soon as the illustrations are ready.

Returns From Blast Furnaces for February 1, 1874.

From the *American Manufacturer.*

Since the first of February, a number of the furnaces in this list reported out of blast have blown in, so that the proportion between the two columns of the table will be somewhat changed for to-day.

There has been but little change as to stocks on hand. In New England, as most of the iron made there is for car wheels, stocks are quite large. Up the Hudson they have been very much reduced since our last report. At Baltimore they are still large. In Eastern Pennsylvania they have been largely sold. About Pittsburgh stocks at furnaces are very small. In the Hanging Rock region stocks are still very large, as they are also in Kentucky, Tennessee and Georgia. The extreme west have had hard times and with large stocks have been compelled to sell low. With the large increase in the number of furnaces in blast, we do not see much sign of an immediate change for the better.

LOCATION.	No. Reported in Blast.	Capacity per Week.	No. Reported out of Blast.	Capacity per Week.
New England	6	420	7	460
New York	29	6,295	4	860
Pennsylvania—				
Schuylkill Valley	28	4,623	16	2,015
Lehigh Valley	31	5,910	18	3,370
Upper Susquehanna Valley	8	925	7	1,080
Lower Susquehanna Valley	22	2,610	9	920
Shenango Valley	12	2,580	14	2,431
Allegheny Valley	5	485	5	635
Pittsburgh	11	3,700	....	....
Other sections	2	350	12	1.230
Maryland—				
Baltimore County	9	755	....	1,060
Virginia—				
Shenandoah Valley	5	210	12	563
West Virginia	3	630	2	730
Georgia	4	395	....	....
Alabama	5	653	3	425
Ohio and Kentucky—				
Mahoning Valley	7	1,865	6	1,090
Hanging Rock	43	4,145	5	807
Other sections, Ohio	9	1,854	9	2,210
Other sections, Kentucky	3	496	1	325
Tennessee	8	1,215	5	246
Indiana	1	175	6	1,080
Illinois	1	250	6	1,930
Michigan	5	600	11	1,580
Wisconsin	5	1,295	4	478
Missouri	6	1,135	8	2,365
Total	258	43,956	180	27,882

Novel Arrangement.

THE Pittsburgh glass factories have for a long time been idle in consequence of a strike, and the outlook at last became so bad that if matters were not arranged soon there could be no work done this season, and the injury to the business would be very serious. Some of the factories are now running on what is certainly a novel basis. The employés are to run the works, guaranteeing the proprietors six per cent. on capital invested—the owners to manage the affairs of the establishment as heretofore, the workmen allowing them to retain twenty-five per cent. of their wages as security for the six per cent. guaranteed. Less success attended the effort of the Ohio Falls Iron Works Company of New Albany, who attempted to replace the old hands, who were on a strike, by new men. The new men were engaged to come and the fires were lighted for them, but they did not put in an appearance. They had been "warned" by the strikers and were afraid to begin work.

THE COAL TRADE.

NEW YORK, March 5, 1874.

The Spring-like weather we have had for the past week, has reduced still lower the hopes of any briskness in the demand for house coals. Were it not for the arrangement controlling the trade, there is no doubt that Anthracite would now be selling at very low prices, for there is nothing but dullness to report. Even the larger dealers, outside of the great companies, report but little doing, and the prospect appears so discouraging that we even hear of some old and well known names going out of the trade. The small amount of coal sold for immediate delivery may be seen from the fact that the shipments from Port Richmond for the week ending Feb. 28 were only 6200 tons, (leaving a balance on hand of 71,000 tons). At South Amboy the shipments amounted to 9256 tons, and the receipts were 11,671 tons for the same period. These facts are the most practical exposition of the state of the Anthracite trade at present.

The time allowed by the Combination for making contracts for season delivery is drawing to a close; applications will be received till the 10th inst. A large amount of coal has thus far been disposed of on contract. The Delaware and Hudson Canal Company reports having made contracts for 500,000 tons, being the whole amount they are willing to dispose of in this manner. The production of this company will, this year, amount to 3 000,000 tons. The other large companies report large sales also, and applications—which are not binding contracts—for coal to a still larger amount. It is very evident that those dealers who are not directly interested in mines, are going to find business exceedingly dull under the new *regime*.

The demand for furnaces and other branches of the iron industry is still very dull, the uncertainty as to what course will finally be adopted on the currency question, and whether tariffs will be reduced or increased, tending to prevent any general resumption of work.

Furnace Coal at Mauch Chunk sells at $3.50 per ton, but line coal for other uses was reduced, as we announced last week, 15 cents per ton.

In Bituminous Coal but very little is doing. Stocks in the Eastern cities are still large, and the trade will probably not open for two or three weeks yet. In Western markets bituminous prices are very low.

The Ohio River has been in navigable condition nearly all winter, and the down-river markets, from Cincinnati to New Orleans, are all glutted. The shipments from Pittsburgh, Pa., within the ten days have been over 5,000,000 bushels by river.

Our very full and reliable coal, iron, and metal market reports from all parts of this country and from Europe will well repay the attention of our readers. We have also added to our other reports a special telegraphic quotation of the Scotch Iron market, as being of value to a large number of subscribers.

PHILADELPHIA, March 4, 1874.

The improvements at Port Richmond will be so far completed this week that shipments of coal may commence on Monday, the 9th inst.

FRANKLIN B. GOWEN, President.

THE Delaware and Hudson Canal Company have, at present, 377,619 tons of coal stored in Honesdale.

IN the ENGINEERING AND MINING JOURNAL of February 7th we gave a statement of the accidents in the mines of the Wyoming region for 1873. At that time the quantity of coal mined was not given. We supplement the note as follows for the Wilkesbarre District, T. M. Williams, Esq., Inspector:

Killed, 46; injured, 91.

Coal produced for the year, 4,232,092 tons, exclusive of consumption at the mines.

The following table is very suggestive:

	Number of persons employed in the District.	Coal mined—tons.	Tons mined per life lost.
1871.....	9,870	.....	56,000
1872.....	9,807	3,250,000	81,560
1873.....	11.355	4 232,092	92,000

Total number of actual miners employed.....2,894

Of the 11,355 persons employed about the mines of this district in 1873, 6,526 men worked inside. Of these, 2,894 were miners; 1,092 boys worked inside, and 2,034 worked outside, for the most part in picking slate in the "breakers," and 1,703 men worked outside in various capacities.

Number of coal breakers in the district 57, including 1 abandoned, 2 standing idle, and 5 new ones that have not yet been operated.

Number of surface openings through which the coals are being hoisted from the mines: Hoisting shafts 36, including 1 abandoned, 2 idle, and 11 new ones being sunk. Slopes 35, including 1 abandoned. Drifts 17. Tunnels 17. Local openings 10; 9 drifts and 1 slope—110 surface openings.

Inside hoisting slopes 18; inside self-acting planes 33. No account of outside planes.

Number of steam engines 295. Single hoisting 85; double 52; breaker engines 50; pumping engines 64, exclusive of steam pumps; fan engines 44. Total estimated horse-power used 12,000. Mine locomotives 13; mules inside 729; outside 216. Fans, 9 single and 1 double have been built in 1873.

BY an unfortunate error in our last week's issue, the officers of the Delaware, Lackawanna and Western Railroad Company, were made to appear as having been elected by the Lehigh Coal and Navigation Company,. We correct as follows: The following officers were elected by the stockholders of the Lehigh Coal and Navigation Company:

President—E, W. Clark.

Managers—Francis R. Cope, Francis C. Yarnall, Fisher Hazard, Charles Parrish, George F. Tyler, Phillip C. Garrett, Charles Wheeler, George Whitney, Alexander Biddle, John Leisenring, Samuel Thomas.

The officers of the Delaware, Lackawanna and Western R.R. Company for the current year are; Sam. Sloan, President; Frederick F. Chambers, Secretary; Andrew J. Odell, Treasurer; Managers—Wm. E. Dodge, Moses Taylor, George Buckley, John L. Blair, Rufus R. Graves, S. B. Chittenden, John Brisbin, George Bliss, Percy R. Pyne, W. W. Phelps, James Blair, W. C. Hunt, Henry R. Bent, and A. L. Dennis.

Coal Freights on the Central Railroad of New Jersey.—No. 32.

TO	From Penn Haven.	From M. Chunk.	From Phillipsburg,
Mauch Chunk.....	$ 14	....	....
Phillipsburg.....	92	$ 78	....
Elizabethport.....	2 07	1 93	$1 15
Port Johnston.....	2 07	1 93	1 15
Newark.....	2 43	2 29	1 51
Hoboken.....	2 07	1 93	1 15

The rate on coal for way points on the New Jersey Railroads will be $1 15 per ton from Mauch Chunk to Phillipsburg.

The above tolls do not include wharfage or shipping expenses at tide ports.

Tolls on Lateral Roads—P. and R. R. R.

PHILADELPHIA, Feb. 25, 1874.

On and after March 2, 1874, the charges on coal transported over lateral railroads will be as follows, until further notice:

1. For shipment via Main Road or Schuylkill Canal, one and one-half cents per ton per mile, and one cent per ton additional to Port Carbon, Mount Carbon, Schuylkill Haven, Pine Grove, Tamaqua, or Port Clinton, for canal, as the case may be.

2. Coal sent to points on the Catawissa and Williamsport Branch will be charged one and one-half cents per ton per mile, and one cent per ton additional to Tamanend.

3. For consumption at local points in coal region, including Shamokin, Herndon, Schuylkill Haven, Pine Grove and Tamaqua, three cents per ton per mile, and one cent per ton additional.

4. Coal sent westward via Northern Central Railway (in N. C.W.R Co.'s cars)will be charged four and two-tenths cents per ton per mile, to Locust Gap, Shamokin, or Herndon.

In addition to the above, a charge for *car service*, of fifteen cents per ton to individuals, and five cents per ton to manufacturers, will be made on all coal sent to local points in the coal region, in Philadelphia & Reading Railroad cars; if the coal passes over the Gordon or Mahanoy Plane, or through the East Mahanoy Tunnel, the charge will be double.

5. No charge will be made less than twenty-five cents per ton, including freight, tolls, and car service.

6. One mile extra will be added for coal passing through the East Mahanoy Tunnel.

7. Fractions of distances and rates will always be stated in *tenths*.

8. No charge will be made for weighing or making returns of coal shipped, and the latter will be furnished free of charge, upon application to the weighmaster; if these returns are to be sent by mail, envelopes, properly stamped and addressed, must be furnished to the weighmasters.

9. All coal will be charged the rates (both lateral and main line) current on the day it is weighed; it will also be waybilled the same day.

Special Drawbacks on Coal Sold Under Contract, Under Circular No. 1, Feb. 25, 1874.

FOR SHIPMENT FROM RICHMOND.

1. The shipper must in all cases furnish the undersigned with the original contract or agreement upon which the coal is to be shipped, which will be returned (properly endorsed and numbered) if required, and a copy thereof preserved in this office. These contracts must either be signed by the parties thereto, in person, or, if otherwise signed, the authority for such signature must accompany the contract.

2. The shipper must sign a certificate, to be endorsed in writing upon the contract, that he has no interest whatever in the coal so sold beyond the price named in the contract, and that no commission or other pecuniary consideration whatever is to be received by him, or on his account, from the vendee or consignee, other than the said contract price.

3. The master of the vessel must sign a bill of lading for each cargo shipped, in the book kept by the General Agent of this Company at Port Richmond.

4. The shipper will send a bill of lading for each cargo to the consignee, who will endorse thereon his receipt of the coal, and return it to the shipper, who must also endorse thereon the fact of its being a shipment under the contract to which it belongs.

5. The shipper will then present his bill for drawbacks, accompanied by the bills of lading endorsed as above, to the Comptroller of the Company, on each Tuesday, for coal shipped during the previous week.

6. The bills will be paid, if found correct, on the Tuesday following presentation.

If any cargo fails to reach its destination from any cause whatever, and is reconsigned, such reconsignment will be considered a new shipment, and the drawbacks will be readjusted under rates current at time of reconsignment.

No drawback bills will be passed by the Comptroller unless the above regulations are fully complied with.

J. W. JONES, First Vice President.

Coal at Port Richmond.

A measurement and estimate of all the lump, steamer, and broken coal at Port Richmond will be made at the close of business this day, and an allowance will be made on all such coal equal to the difference between the rates now charged and the rates that take effect on March 2d.

The rates of freight tolls on Millersburg and Lykens Valley coal will be as follows, from March 2d, 1874, until further notice:—

In Company's cars, per ton of 2240 pounds.

Dauphin to Richmond, for shipment.....$2 00 per ton.
" Philadelphia..... 2 10 "

Distribution of Cars.

Hereafter in distributing coal cars to the collieries, six yellow cars will be considered equivalent to five black cars.

COAL PRODUCTION.

Anthracite.

Mined for the week ending February 28, 1874.

	WEEK. tons.	YEAR.* tons.
Wyoming Region.		
Delaware and Hudson Canal Co.....	44,123	288,700
Delaware, Lackawanna and Western RR....	38,659	337,442
Pennsylvania Coal Co.....	21,306	167,779
Lehigh Valley R.R.....	21,842	145,784
Pennsylvania and New York Railroad.....	1,805	8,804
Central Railroad of New Jersey.....	27,627	108,520
Lehigh Region.		
Lehigh Valley Railroad.....	40,973	395,335
Central Railroad of New Jersey.....	6,765	74,289
Schuylkill Region.		
Philadelphia and Reading Railroad.....	37,201	354,385
Shamokin and Lykens Valley.....	6,452	58,580
Sullivan Region.		
Sullivan and Erie Railroad.....	315	4,428
Total.....	247,068	1,944,046

* Year beginning January 1st.

At Port Richmond.—The shipments for the week ending Feb. 28 were 6,200 tons, leaving on hand 71,000 tons.

Shipments of Bituminous Coal for the Week Ending Feb. 28.

	Week. Tons.	Year. Tons.
Cumberland and Pennsylvania R.R	18,955	164,594
Cumberland Branch R.R.....	2.541	17,596
Philadelphia and Reading R.R..... ...	4,998	46,977
Barclay R.R.....	3,536	34,816
Huntingdon & Broad Top R.R.....	9,552	90,426
Tyrone Division Penn. R.R.....	....	79,555

The St. Louis Coal Trade.

The following table exhibits the quantity of bituminous coal received in East St. Louis by the following routes of transportation, for the week ending Feb. 28, 1874:

	Cars.	Feb. 17. bush.
Belleville and Southern Illinois	484	140,360
Ill. and St. Louis R.R. & Coal Co.....	261	75,690
Ohio and Mississippi.....	227	65,830
St. Louis and Southeastern..... .....‡	115	33,350
St. Louis, Vandalia, T. H. & Ind.....	108	31,320
Total.....‡	195	346,550

MARKET PRICES OF COAL.

Import Duty on Coal.

Anthracite free. Bituminous, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All slack, or culm, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c., gold.

ANTHRACITE.

WHOLESALE PRICES.†
f. o. b. at Shipping Ports.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
Scranton at Elizabethport‡....	4 70	4 80	4 90	5 05	5 50	4 50
*Lackawanna.....	4 55	4 65	4 75	4 90	5 35	4 35
§Pittston at Weehawken.....	4 50	4 50	4 60	4 70	5 10	4 35
Wilkesbarre at Port Johnston..	4 55	4 65	4 75	4 90	5 35	4 35
Newport and Plymouth.....	....	....	4 75	4 90	5 55	4 35
Susquehanna Coal Co.at Amboy	4 70	4 80	4 85	5 00	5 45	4 45
Lehigh Coals.						
Old Company at Port Johnston.	5 50	....	5 45	5 45	5 60	4 65
Old Company's Room Run.....	5 00	....	5 00	5 00	5 35	4 35
Sugar Loaf at Port Johnston...	5 50	....	5 45	5 45	5 60	4 65
Hazleton at Elizabethport.....	5 35	....	5 30	5 30	5 45	4 50
Honey Brook at Elizabethport..	5 35	....	5 30	5 30	5 45	4 50
Spring Mt. C. Co. at Hoboken..	5 35	5 35	5 30	5 30	5 45	4 50
Beaver Meadow at South Amboy	5 50	....	5 45	5 45	5 60	4 65
McNeal at Port Johnston	5 35	5 35	5 30	5 30	5 45	4 50
Schuylkill Coals at Port Richmond.						
Schuylkill White Ash	4 05	4 15	4 25	4 40	4 85	3 50
Schuylkill Red Ash.....	....	....	4 40	4 55	4 85	3 75
Shamokin W. and R. Ash.....	....	....	4 50	4 85	4 85	4 00
N. Franklin.....	....	....	4 85	4 85	4 85	3 75
Lorberry	....	....	5 00	5 00	5 00	4 00
Lykens Valley	....	....	....	5 50	5 50	4 25

§Ex-commission.

* f. o. b. in New York Harbor.

† Prices for March, as per circulars dated Feb. 19 and 20.

‡ Scranton sale, Feb. 25, averages: Steamer, 4 52½; grate, 4 53; egg, 4 74; stove, 5 18¾; chestnut, 4 19¾.

WHOLESALE PRICES.

New York.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
Scranton	5 20	5 30	5 40	5 55	6 00	5 00
Lackawanna*	5 05	5 05	5 25	5 40	6 85	4 85
Pittston	4 95	4 95	5 05	5 15	5 65	4 80
Wilkesbarre	5 00	5 10	5 20	5 35	5 80	4 80
Newport & Plymouth	....	....	5 20	5 35	6 00	4 80
Susquehanna Coal Co.	5 20	5 30	5 35	5 50	5 95	4 95
Lehigh Coals.						
Old Company	5 95	....	5 90	5 90	6 05	5 10
Old Co.'s Room Run	5 45	....	5 45	5 45	5 80	4 80
Sugar Loaf	5 95	....	5 90	5 90	6 05	5 10
Hazleton	5 80	....	5 75	5 75	5 90	4 95
Honey Brook	5 80	....	5 75	5 75	5 90	4 95
Spr'g Mount. Coal Co.	5 80	5 80	5 75	5 75	5 90	4 95
Beaver Meadow	6 00	....	5 95	5 95	6 10	5 15
McNeal	5 80	5 80	5 75	5 75	5 90	4 95
Schuylkill Coals.						
Schuylkill W. A.†	4 90	5 00	5 10	5 25	5 70	4 35
" Red Ash	...	....	5 40	5 55	5 85	4 75
Shamokin W. & R. Ash	....	....	5 50	5 85	5 85	5 00
North Franklin	....	....	5 85	5 85	5 85	4 75
Lorberry	....	....	6 00	6 00	6 00	5 00
Lykens Valley	....	....	....	6 50	6 50	5 25

* Delivered on wharf.
† Delivered alongside.

BITUMINOUS.

WHOLESALE PRICES. F. O. B.

Broad Top	$6 50
Derby	6 50
Kittaning	6 50
George's Creek Cumberland	7 00@7 25
West Virginia Gas	8 75
West Virginia Cannel	14 00
Penn. Gas	9 00
Westmoreland Gas	9 00
Ohio Caking	10 00
Ohio Cannel	13 00
Lyonsdale Coal	12 50
James River Bituminous	7 00
" Carbonite	10 00
Kanawha River Cannel	15 25
Liverpool Gas Cannel	14 00
" House "	20 00
Newcastle Gas	10 00
Cannelton Cannel	15 00
Red Bank Cannel	9 00

RETAIL.

PER TON OF 2000 LB.

Liverpool House Orrel, delivered	$20 00@$22 00
Liverpool House, Cannel, delivered	20 00@ 25 00
American and Block, delivered	16 00@ ——
Straitsville Cannel	16 00@ ——

	Grate and Egg.	Stove.	Chestnut.
Pittston Coal, in yard	$5 60	$5 80	$5 00
Delaware & Hudson, delivered	6 60	6 85	6 10
Scranton, delivered	6 75	7 00	6 25
Wilkesbarre, in yard	6 00	6 25	5 50
Lehigh and Locust Mountain, del'd	7 00	7 50	6 50

Georgetown, D. C., and Alexandria, Va.*

George's Creek and Cumberland f. o. b. $4 60@4 75, wholesale.

Buffalo, N. Y.

Youghiogheny Gas Coal	$6 00
Catfish Lump	4 75
" Nut	3 50
" Nut and Slack	3 00
" Slack	2 85
Connellsville coke	8 00
Beaver Gas Coal	6 50

Anthracite, per 2000 lb. in cars; retail prices, delivered, $1 50 per ton additional.

Lump	$6 50
Grate	6 00
Egg	6 25
Stove	6 50
Chestnut	6 25

Baltimore.

Wholesale Prices to Trade.

Corrected weekly by E. Stabler, Jr., coal merchant.

Wilkesbarre, by cargoes or cars	$6 25@....
Pittston and Plymouth	6 00@....
Shamokin Red or White Ash	6 00@6 25
Lykens Valley Red Ash	6 80@....
Retail, per ton 2240 lb. (all kinds)	7 50@ 8 50
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 75@5 00
West Va. Gas Coal f. o. b. at Locust Point	6 50@....
Kanawha Cannel, coarse	13 00@....
Tyrone	7 25@....
Bitchie Mineral of West Virginia	19 00@....

Boston, Mass.—March 2.

The market here is only moderately active, and prices are without material change. Manufacturers are making but comparatively few contracts for the season. Cumberland is quiet.

English Cannel	$25 00@26 00
do do from ship	22 00
Scotch Cannel	15 00@18 00
American Cannel	14 00@15 00
Lingan	8 25
Caledonia	7 75
Pictou	8 25
Sydney	9 00
Acadia	6 75@ 7 25
Cumberland	7 65@ 8 00
Anthracite, retail	8 75@ 9 00
" by cargo	7 50@ 8 00

Chicago, Ill.—March 2.

REPORTED BY RENO & LITTLE, COAL MERCHANTS.

No change in prices of coal. The weather is mild, and the demand light. The stocks are large for the season:

Lehigh Lump	$11 00
Lehigh prepared	10 50@11 00
Lackawanna, Wilkesbarre and Pittston	10 00

BITUMINOUS.

Briar Hill and Erie	8 00@ 8 50
Walnut Hill (West Va.)	8 00@ 8 50
Midway (West Va.)	8 00@ 8 50
Cannel	9 00@ 10 00
Blossburg	9 00
Indiana Block	6 50
Hocking " Brooks"	8 00
Wilmington and Illinois	5 00

Cincinnati, O.

The supply is ample and the market is quiet, but steady.

We quote:

Youghiogheny, afloat	9 c.
Ohio River, per bushel	8 c.
Pittsburgh " "	11c.
Anthracite " ton	$11 00

The following are retail prices delivered:

Ohio River, Pomroy, per bushel	12 c.
Kanawha, " "	13 c.
Kanawha Cannel " "	23@24 c.
Pittsburgh, " "	12 c.
Youghiogheny	14 c.

Cleveland, O.

Youghiogheny, f. o. b., per ton	$5 25
Briar Hill	4 00
Massilion	3 60@3 75
Massilion nut	3 50
Chippewa	3 60@3 75
Hocking Valley	3 75
Morris	3 60
Cleveland Lump	3 00
Silver Creek	4 60
Anthracite, prepared	10 00
Anthracite, lump	11 00

Detroit.

The market is steady and unchanged. The following are present quotations:

Lehigh Lump, per ton	$11 00
Lehigh nut	10 00
Scranton, various sizes	9 00
Blossburg	9 00
Willow Bank	8 00
Briar Hill	8 50
Brookfield	8 50
Chippewa	8 00
Massilon	8 00
Straitsville	5 50
Nut	4 75

Indianapolis.

Per 2000 lb. WHOLESALE.	
Brazil Block	$3 65
Highland	3 20
" steam	3 20
Brazil nut	3 60
Slack Coke	2 50
Virginia Cannel	9 00
Indiana Cannel	7 20
Steam Nut	3 00
Hocking Valley	6 00
Gas Coke per bush	14 c.
Pittsburgh	5 65
Sand Creek	5 00
Anthracite	12 00

Louisville, Ky.

Pittsburgh, afloat per bushel	10½@11 c
" retail "	14 "
Kentucky " "	12@14"
Indiana and Peacock Pomroy "	12@14"
Anthracite, per ton, delivered	$10 00@10 50
" afloat	9 00@ ....

Mauch Chunk.

The prices for line trade are:

	Lehigh.	Wilkes-Barre.
Lump	$3 50	$3 24
Steamboat	3 50	3 24
Broken	3 50	3 49
Egg	3 50	3 49
Stove	3 75	3 64
Chestnut	3 25	3 24
Pea	1 50	....

New Orleans, La.

The supply is more than sufficient for the demand. We quote:

Pittsburgh, wholesale, per bbl	45c.@50c.
" at retail	75c.
" per hhd	$7 00
" per box to steamboats	50c.
" " to manufacturers	60c.
Virginia cannel, per bbl	$1 25
Anthracite, per ton	$13 00

Philadelphia.

ANTHRACITE.

Broken, in the yard	$5 50
Egg and Stove	5 75
Chestnut	4 75

BITUMINOUS.

Pennsylvania and Westmoreland Gas	7 50
Broad Top	5 25
Powelton Sterling	5 25
Derby	5 50

75 cents per ton additional for delivery.

Pittsburgh, Pa.

Connellsville coal per ton,	$2 00@2 25
Youghiogheny, at Pittsburgh	2 25
Youghiogheny, at the mines	2 00
Coke on cars " "	3 25
Castle Shannon on Platform per bushel,	9½ c.
Anthracite, nut, per ton per ton	7 25
" broken	7 50
" egg	7 50
" stove	7 50
" broken on cars	6 75
" stove " "	7 00

San Francisco.

From Commercial Herald, Feb. 19.

In the last issue we noted the sale of the Pactolus' cargo of Cumberland from Baltimore—say 597 hhds. and 1,001 tons bulk—terms strictly private, but believed to be at a price to cover cost and freight. There is another cargo or more of this description advertised for sale by a dealer, causing some depression in the market. At the same time we repeat the notice given last week, that the new ship Sumner, Mead, has been chartered to load a like cargo in Baltimore for HASTE & KIRK of this city. This will make three cargoes en route of this description, which, considering the light demand for this kind of coal, must have a tendency to depress prices all the year. The Rey Borland is at hand from New South Wales with 680 tons Wallsend, which is held at full figures. The Lookout, from Bellingham Bay is at hand with 1,300 tons.

West Hartley, wholesale, ex ship,	per ton	$13 00
Wallsend,	"	12 00
Australian,	"	11 00@12 00
Coos Bay	"	10 00
Nanaimo	"	11 50
Bellingham Bay, ex ship	"	8 50
Mt. Diablo, coarse	"	8 50
" fine	"	6 25
Anthracite	"	16 00@17 50

St. Louis, Mo.

Delivered in St. Louis 4 cents per bushel extra.

	Per bushel.	Per ton.
Illinois coal, retail at East St. Louis	9½ c.	$2 66
" " manufacturers	8½ c.	2 38
" " delivered	12@12½ c.	3 40
Big Muddy	14 c.	3 92
Trenton	12 c.	3 36
O'Fallon	9½ c.	2 66
Anthracite, delivered in St. Louis		$13 50
Missouri cannel, " "		6 50
Indiana cannel		7 00

Toledo.

Grate	$9 00
Egg	9 00
Stove	9 00
Chestnut	9 00
Lehigh Lump	11 00
Blossburg	8 50@ 9 00
Briar Hill	7 00
Bituminous	$4 50 to 6 50 as per quality.

Halifax, N. S.

Sydney Coal, per chaldron	$8 50@ 9 00
Victoria " "	....
Gowrie	7 50
Little Glace Bay	7 50
Albion (at Cunard's wharf)	7 50

Toronto.

Scranton, all sizes, per ton	$7 50
Lehigh prepared, " "	8 50
" Lump	9 00
Bituminous	7 50
Blossburg	7 00

Montreal.

Scotch Steam, 2000 lb. ex yard	$8 00@ 8 50
Lower Port, do	7 00@ 8 00
New Castle Grate, ex yard	9 00@11 00
Welsh Anthracite, per 2000 lb	9 00@10 00
English Coke	—@—
Lump Lehigh, per 2000 lb	9 00@ 9 50
Grate	8 00@—
Egg, American Anthracite	8 75@—
Stove, " "	9 00@—
Chestnut " "	8 50@—

Freights.

PORTS.	From Elizabethport, Port Johnson, South Amboy and Hoboken.	From Philadelphia.†	From Baltimore.
Amesbury	....	....	....
Bangor	....	....	....
Bath	....	....	3 00
Boston	2 10	2 50	2 65
‡Bridgeport	90	1 45	2 10
Bristol	....	....	....
Charlestown, Mass	....	....	....
Chelsea, "	2 10	....	....
Davenport	....	....	....
Derby	1 00	....	....
Dighton	....	....	2 50
East Cambridge	....	....	....
Fall River	1 30	2 00	2 25
Hackensack	....	....	....
Hartford	....	....	3 25
Hoboken	40	1 15	1 75
Jersey City	40	1 15	1 75
Lynn	2 10	....	....
Middletown	....	....	....
Mystic	....	....	....
New Bedford	1 40	2 00	2 25
Newburyport	....	2 75	2 75
New Haven	....	1 50	2 10
New London	1 10	1 65	2 10
Newport	1 30	2 00	....
§New York	45	1 15	2 00
Norwalk	90	....	2 25
*Norwich	1 20	....	2 50
Pawtucket	....	....	....
Portland	2 00	2 60	2 65
Portsmouth, N. H.	2 00	2 75	2 75
Providence	1 30	2 00	2 25
Rockport	....	....	....
Saco	....	....	....
Somerset	....	....	....
Sag Harbor	....	....	....
Salem	2 10	....	2 70
Stamford	90	....	....
Stonington	1 20	....	....
Taunton	....	....	....
Warren	....	....	....
Washington	....	....	....
Warscham	....	....	....
Wareham	....	....	2 75

* Towing from New London about 10c. per ton.
† Nominal.
‡ Under 150 tons, $1 per ton.
§ Under 150 tons, 50c. per ton.

The rate of freight, including wharfage and shipping expenses, from Mauch Chunk to South Amboy, Elizabethport, Port Johnston and Hoboken is $2 28.

Rate of freight from Mauch Chunk to Trenton, including "expenses." $1 97.

Freight to Philadelphia from Mauch Chunk, via N.P.R.R., $2.

TOWING.

Rates for towing continue irregular and unsettled. Below are quotations, which will serve as an approximation to the present average rates :

To Elizabethport, full loads and return	$18 00
To Port Johnson " "	16 00
To New Haven or Bridgeport	75 00

Harbor Towing ranges from £ 50 to $6 00.

Provincial.

The shipments from the Provincial Ports have ceased for the season, and will not be resumed before next Spring. Our quotations, therefore, are merely nominal.

	Coarse.	Slack.
Block House, f. o. b. at Cow Bay	$2 50	$1 25
Gowrie	2 25	....

	Coarse.	Culm of Coal.
Pictou nett	$3 00	$1 50
Sydney	3 25	1 00
*Lingan	2 75	1 00
*Caledonia	2 25	....
*Glace Bay	2 25	....

* These prices are fixed for 1874, shipments f. o. b., gold.

IRON MARKET REVIEW.

Import Duties.

The following are the duties in Gold on Iron :

Flat iron, not less than 1, nor more than 6 inches wide, nor less than ¾, nor more than 2 inches thick. *Round Iron*, not less than ¾, ner more than 2 inches in diameter, and *Square Iron*, not less than ½, nor more than 2 inches square ₱ lb. 9-10 of 1c. *Flat Round or Square Iron*, of larger or smaller sizes than the above mentioned, per lb 1 35-100c

Provided, that all iron in slabs, blooms, loops, or other forms, less finished than bars, and more advanced than pig iron, except castings, shall pay the same as iron does.

Provided, that none of the above iron shall pay less than 31½ per cent.

Railroad Iron	63c. per 100 lb.
Boiler plates, or other plate iron not less than 3-16 of an inch thick, per lb	1 35-100c.
Scrap castings per ton	$5 40
" wrought " "	7 00
Pig Iron per ton	6 30

Iron ore 10 per cent. *ad valorem*.

New York—March 5, 1874.

There is no particular change to note in the iron market. The most important cause of the present stagnation is the unsettled question of finance, and those best informed on such matters think there will be no material change, until this is settled.

American Pig.—The furnace companies are still unwilling to contract for future delivery. The demand is entirely for immediate consumption, which is quite small. We are unable to learn of a single sale amounting to 1000 tons, having taken place during the last three weeks. Matters on the Lehigh stand as we last reported ; the Lehigh Crane Iron Co's. men being the only ones on a strike. We quote :

No. 1, Foundry Anthracite	$34 00@35 00
No. 2, " "	32 00@33 00
Grey Forge	29 00@31 00
White and Mottled	24 00@27 00

Scotch Pig.—The sales of Scotch Pig can be classed only as retail, there have been none worthy of mention. There is but little enquiry. The stock for an ordinary demand would be considered light. The recent rapid decline in Glasgow, and the feeling that the bottom is not yet reached—although we are informed by cable of an advance—is keeping off most buyers. We quote :

Glengarnock	41 00@42 00
Coltness	42 00@43 00
Eglington	40 00@41 00

Rails.—In iron rails there is nothing doing. There is some enquiry but we can learn of no important orders having been placed. We quote American at $60, currency, at the mills ; and Foreign at $55, gold. The manufacturers reluctantly give quotations, as in most cases they are only used to influence the market. An offer to take a quantity would, undoubtedly, be accepted at figures lower than the above.

Old Rails.—We learn of no transactions, and quote T's $40 ; double heads, $45.

Scrap.—There is no change in the scrap market. No. 1 wrought is quoted at $42@$44, and No. 1 cast at $28@$32.

Bessemer Steel Rails.—At the present moment contracts have been made for about one-third of the year's production of all the Bessemer mills in this country. The Eastern mills are not very full of orders, but the Western mills are running on full time. There is considerable enquiry, and the prospects are that in a very short time all the mills will be running on full time. The Johnstown Mill is running on an order for 5,000 tons for the Chicago and Northwestern Railroad, and the Chicago Mills on 5,000 tons for the same road. The Milwaukee and St. Paul Railroad has given orders for 7.500 tons, and the Rock Island for 3,000 tons, which are divided between the Joliet and the Chicago mills. The Bethlehem Iron Co. has an order from the Central Railroad of New Jersey for 4,500 tons. The Troy Mills have orders for several thousand tons from Eastern roads. We quote at $105 at tide-water, and $103 at mills.

SCOTCH PIG.

By Special Cable Report.

GLASGOW, March 5.

Coltness	102s.
Carnbroe	98s.
Eglinton	93s.
Glengarnock	98s.

Boston, March 2, 1874.

There is no improvement in the demand for refined bar. Sales continue to be made in round lots from first parties at $70. The market is dull. Pig iron is very quiet, but prices of American are steady. Scotch is nominal. We quote yard lots as follows :

No. 1 American	$39 00@$41 00
No. 2 American	36 00@ 38 00
Charcoal	50 00@ 60 00
SCOTCH PIG IRON.	
Eglinton	45 00@ ....
Coltness	49 00@ ....

Chicago, March 3, 1874.

The demand for pig iron is good, and liberal sales are being made. Prices are steady, at the following quotations :

Coltness	$53 00@ ....
Calder	52 00@ ....
Glengarnock	51 00@ ....
Eglinton	50 00@ ....
Lake Superior No, 1	52 00@ ....
Lake Superior No. 2	50 00@ ....
Chicago No. 1	48 00@ ....

Cincinnati, March 2, 1874.

The market continues without activity in any grades. There has been some little inquiry for car wheel iron, at prices largely below present quotations. Hanging Rock Charcoal brands remain moderately firm at inside quotations. Forge irons are in large demand and prices are nominal. The following are quotations at 4 months :

HOT BLAST CHARCOAL.

Hanging Rock, No. 1, per ton	$38 00@40 00
" No. 2, "	35 00@37 00
" Forge	30 00@32 00
Tennessee No. 1	37 00@38 00
Tennessee. No. 2	34 00@36 00
" Forge	30 00@32 00
Alabama, No. 1	38 00@40 00
Missouri, No. 1, Foundry	38 00@40 00
" No. 2	35 00@37 00

HOT BLAST STONE COAL.

Missouri, No. 1	37 00@37 00
" Forge	30 00@32 00
Ohio No. 1, Foundry	35 00@37 00
Ohio Forge	30 00@31 00

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	60 00@65 00
Missouri "	58 00@60 00
Tennessee "	55 00@58 00
Kentucky "	55 00@60 00
Georgia "	55 00@60 00
Alabama "	55 00@60 00
Machinery and Forge	55 00@57 00
Blooms	105 00@116 00

Cleveland, March 4, 1874.

C. E. Bingham & Co., dealers in pig iron and iron ores, report the market as follows : The only marked change in the Cleveland pigi ron market during the past week has been a decline of about $1 per ton in mill iron. Other grades of iron have remained tolerably firm, with a demand about the same as last indicated. We quote as follows;

No. 1, Anthracite Foundry	$35 00@36 50—4 mos
No. 2, " "	33 00@34 00—4 mos
No. 1, Bituminous "	35 00@36 00—4 mos
No. 2, " "	32 00@33 00—4 mos
No. 1, Grey Forge Bituminous	30 00@31 50—4 mos
No, 2, Close Grey	29 00@30 50—4 mos
No. 1, Massilon Black Band	37 00@37 50—4 mos
No. B-1 " "	35 00@36 50 —4 mos
No. 2 " "	34 00@35 00—4 mos
No. 1, Lake Superior Charcoal	43 00@45 00—4 mos
No. 2, " "	41 00@43 00—4 mos
No. 3, " "	47 00@50 00—4 mos
Nos. 4, 5, 6, " "	50 00@56 00—4 mos

Detroit, March 2, 1874.

Scotch pig, net	$46 00@ ....
Lake Superior pig, net	44 00@ ....

Louisville, March 2, 1874.

Pig iron has a limited inquiry, and prices have been nominally supported, though the tone is rather heavy.

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores	$40 00@41 00
No. 2 " " "	35 00@37 00
No. 1, forge, " "	32 00@33 00
No. 1, foundry, " Tennessee "	35 00@40 00
No. 2 " " "	33 00@34 00
No. 1, forge, " "	30 00@33 00
No. 1, foundry, " Alabama "	36 00@40 00
No. 1, " " Iron Mountain "	41 00@43 00

HOT BLAST—STONECOAL.

No. 1, foundry, from Missouri ores	35 00@38 00
No. 2, " " "	32 00@34 00
No. 1, forge " "	30 00@32 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	60 00@65 00
" " Tennessee "	55 00@56 00
" " Alabama "	58 00@60 00
" " Georgia "	58 00@60 00
" " Missouri "	55 00@60 00
" " Kentucky "	55 00@60 00

Pittsburgh, March 4, 1874.

Reported by A. H. CHILDS, commission merchant for the sale of pig iron, blooms, ore, &c.:

There has been no special change in pig iron since last report. The market continues dull and heavy, but prices have thus far been maintained, with sufficient firmness to indicate the confidence of holders in the near future. Quotations remain unchanged. From the *Commercial*, we learn of sales of the following, on 4 months : 800 tons mill iron, at $30; 400 tons grey forge red short, $30; 160 tons do. $31; 36 tons silvery, $28; 30 tons clear grey forge, mottled and white, $29; and 20 tons No. 1 foundry, $33; 140 tons grey forge was sold at $29 cash.

No. 1, Foundry, anthracite or bituminous	$34 00@35 00—4 mos
No. 2, " " "	32 00@33 00—4 mos
No. 1, Grey Forge, " "	30 00@31 00—4 mos
No. 2, " " "	29 00@ ....
White and mottled " "	27 00@28 00—4 mos

Philadelphia, March 3, 1874.

In forge irons there is some little inquiry, but at very low figures. In other brands there is comparatively no inquiry. The rail mills are starting up on orders, and are in the market for pig ; 500 tons were sold at works at $63, and 1500 tons on private terms.

The following are quotations :

American No. 1	$34 00@35 00
American No. 2	32 00@33 00
American No. 3	29 00@30 00
Scotch—Glengarnock	46 00@ ....
" Eglinton	45 00@ ....
New rails, at works	63 00@65 00

St. Louis.

MISSOURI IRON ORES.

Iron Mountain Co.'s Quotations.

Iron Mountain, per ton	$8 00
Benton Creek, "	7 50
Surface ores, "	8 00
Red and brown hematites, per ton	6 50
Pilot Knob, per ton	5 50

PIG IRONS.

Iron Mountain and Irondale Charcoal, hot blast metals. (4 months' time), No. 1	$45 00@46 00
No. 2, same as above	40 00@43 00
Mottled and white	56 00@ ....

METALS.

NEW YORK, March 5, 1874.

Gold has ranged from 111¾ to 112¾, and is now quoted at 112⅛.

Bullion.—Fine silver bar $1 26½@1 27 per ounce. Fine gold bar at par—$20 67 per ounce.

Copper.—The demand for ingot copper during the last week has been light, sales only amounting to 150,000 pounds at 24½@24¾c. There has been no transactions for future delivery. Manufacturers are not disposed to buy largely, and there is no speculative feeling.

Tin.—There is very little demand for pig iron, and prices are lower. Cable telegrams from London report a depressed state of the market there, and a very limited business. The latest quotations received from England are: Straits, £99@£100; L. and F., £105, and English refined, £110. The sales for the week in this market are reported to be 35 tons of English L. and F. at 23@23¾c., part to arrive; 15 tons English refined at 24¼@24¾c. The closing quotations are: Straits, 26¾@27c.; Banca, 28½@29c.; Billiton, 26¾@27c.; L. and E., 23@23¼c.; English refined, 25c., all gold.

Lead.—There are no transactions in foreign pig to report, and prices remain nominally at 6¾@6⅞c., gold. About 75 tons of domestic pig are reported as having been sold at 6¼c., gold.

Spelter and Zinc.—There is nothing doing in foreign spelter, and prices are entirely nominal. Western is being disposed of in small lots at 7¼@7½c., currency. There is a moderate demand for zinc.

Antimony.—There is a demand for Regulus in small quantities at 13@13½c., gold, according to brand, but the business is very limited.

SAN FRANCISCO IRON MARKET.

SAN FRANCISCO, Feb. 19, 1874.

The market is exceedingly quiet for all descriptions. At present the demand for Pig Iron is very small, by reason of the long-continued rains, which have retarded travel and teaming over the country, and stopped building and outdoor work generally. A better time is thought to be near at hand, when trade will revive materially. We quote English and Scotch Pig at $45a$50.

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, March 5, 1874.

We have advises from the San Francisco Stock Board dated the 3d inst. Without exception the market has declined, Savage materially so, being quoted at $81, a decline of $29 per share as compared with our last. Following are the quotations :

Savage	81	Imperial	6
Crown Point	85	Raymond & Ely	29
Yellow Jacket	59	Meadow Valley	10¾
Kentuck	18	Eureka V. G	10½
Chollar Potosi	62	Ophir	—
Gould & Curry	21	Hale & Norcross	—
Belcher	86		

Boston Stock Market.

BOSTON, March 4, 1874.

We give below the bidding prices for stocks at the first session of the Boston Stock Board :

Calumet and Hecla Co.	140	Ridge	7
Copper Falls	24	Rockland	1⅛
Central	27	Phœnix	14
Quincy	38½	St. Clair	2⅛

DURING the year 1873 there were 35 new colliery companies launched in England, with a total capital of about five millions, sterling.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.
JOHN A. CHURCH, E. M. } Editors.
RICHARD P. ROTHWELL, C. E.
Editor of the Coal and Iron Department.

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THE *Scientific American* quotes with commendation our remarks upon the bill which Senator SUMNER has introduced to prevent the use of castings as patterns (this journal, February 14.) It adds among other remarks "the above measure virtually prevents a farmer from re-casting his plow point; it prevents the printer from duplicating his type pages by electrotyping or stereotyping. We might continue and cite other instances where the sole effect of the law will be simply oppression and a retardation of industry, in lieu of a furtherance of its best interests." Besides the difficulties here mentioned in the way of a thorough operation of the law we have heard others. We believe an amendment was to be made to the bill allowing broken castings to be used as patterns in mending the structure they formed a part of. In fact it would be impossible to carry out this law without cataloguing an enormous number of exceptions. It is hopeless to say that the courts may interpret the law in a liberal spirit. When men trust to the liberal interpretation of a law by the courts they are apt to find out that lawyers have no disposition, and judges no power, to be liberal. The truth is this bill belongs to a very objectionable kind of class legislation and should be laid on the table.

THE accident at the Cambria Bessemer works, Johnstown, Pa., two weeks ago, was an occurrence which shows the imperative need of care, and cleanliness, as one of the elements of safety, in such works. An unnoticed sprue stood on the floor of the pit and a little water had made its way there, too. Unfortunately the sprue stood just on the spot where the ladle with its charge of steel was lowered to bring it down to the ingot moulds. The ladle struck the sprue and rested on it, the rack in which the ladle rests continuing to descent. When this was noticed the crane was brought up under the ladle again but the cogs on the rack, instead of interlocking with those on the ladle gudgeon, came up butt against them. Probably there was a slip which brought the ladle forcibly down to its seat again, but, at all events, there was a break on one side and the ladle swung down letting its contents into the pool of water on the pit floor. There was a tremendous explosion, and a shower of melted steel was thrown about, causing one of the worst accidents known in Bessemer practice in this country. In the early days of Bessemer work it was not such an uncommon thing to make a casting on the floor of the pit, instead of in the moulds, but in such cases time was usually allowed the workmen to put themselves in safety. On one occasion, however—we believe at the Königshütte in Germany—the man at the valves allowed the converter to tip too far and the melted iron began to run out on the floor. Then he became agitated, and instead of reversing the valves, turned them further so that a heavy stream of melted iron poured out and several men were injured. It is traditional that this accident caused the abandonment of the Bessemer process at the works named, but it is more probable that this was but the culmination of a long line of pit castings which disheartened the managers. When Mr. HOLLEY's paper before the Institute is published our readers will know the means by which such irregular practice has been converted to a systematic and precise regularity of operation.

AMONG the noticeable features of the recent meeting of the Mining Engineers was the enterprise displayed by the New York *Times* in sending a corps of reporters to the sessions of the Institute and in laying before the public every morning during the meeting a full account of the proceedings of the previous day. Other daily papers of New York noticed the meetings favorably, without, however, undertaking the formidable work of fully reporting them. Under these circumstances, it was eminently proper that the Institute, in passing a general vote of thanks to the press of New York, mentioned with particular praise the extraordinary zeal and ability shown by the *Times*. We were not a little surprised to find in the New York *Tribune* of Saturday a copy of the resolution of thanks referred to, from which the clause, according well-deserved recognition to the *Times*, had been entirely omitted. The *Tribune* aims to be, and comes very near being, a complete and impartial newspaper. The petty device of suppressing a favorable notice of a rival journal in the copy of a resolution which it professes to give entire, is certainly not worthy of it. Of course the *Tribune* may with propriety give mere brief notices, instead of detailed reports, of a meeting, the proceedings of which it may consider too technical for extended display in its columns; but when another journal, judging the case differently, incurs the trouble and expense of doing for a meeting of engineers what the *Tribune* chose to do for the lectures of AGASSIZ, or the proceedings of the American Association at Portland, it seems to us that in such an instance that great newspaper should not hesitate to award to a rival the praise which it is never slow to claim for itself.

Damage from Furnace Smoke Denied.

THE question of damage to vegetation by the gases escaping from the chimneys of smelting works is an old one, and for many years it was conceded that these gases seemed to poison the ground. The wasted fields lying near lead and copper works were pointed to in corroboration, and analyses of the soil showed that in some cases very perceptible amounts of elements injurious to man were contained in the surface earth. In obedience to this impression, the smelting-works of Europe have long been subject to demands for damages, which in some cases have been very heavy. Under the old condition of things, in which a great many of the processes of metallurgy were performed on the bare ground, when condensation apparatus was almost unknown, and substances which are now carefully collected for sale, were driven off into the atmosphere, this belief may have had a basis which it has lost with the introduction of better methods of work. In fact, of late years, several scientific men have expressed themselves against any such notion as that the ground near smelting works became so poisoned as to contaminate the plants grown on it, and render them unfit for food. The latest of these investigations was undertaken by Dr. MORITZ FREYTAG, Professor in the Agricultural Academy near Bonn. The smelting works at Freiberg, having made additions to their condensing apparatus, employed him to ascertain what the amount of damage really was and how far it could extend under the most unfavorable circumstances, in their neighborhood. He made a most thorough investigation, a lengthy report of which is published in the Freiberg *Jahrbuch* for 1873. His conclusions are most important, refuting as they do the old ideas on this subject. They are six in number and he emphasises them with great distinctness as follows:

1. The sulphurous acid, sulphuric acid, arsenious acid and zinc salts in the smoke from the Freiberg smelting works may, under unfavorable circumstances, even with the present condensation apparatus, inflict appreciable injury upon the vegetation of the neighborhood, especially along the Mulde (the stream on which one of the smelting works is built) or the strip of land surrounding the reservoirs. The injury is caused by the deposition, from such smoke as is sufficiently heavy, of the injurious substances upon the slightly moist leaves. By evaporation of the water the acids become sufficiently concentrated to corrode the organisms and convert them to precisely the condition to which they would naturally come by decay.

2. A poisoning of the ground or of the entire plant cannot, however, under any circumstances, take place.

3. The supposition that furnace smoke inflicts an injury to vegetation, greater than that which is apparent to the eye, is not to be sustained, and the payment of damages based upon that supposition is unadvisable, inasmuch as it contradicts the ground principles of all exact investigation, and gives the unthinking masses constant opportunity to raise new demands for supposed damages from furnace smoke.

4. A decrease in the nourishing qualities of fodder, by evident injury to the leaves, is to be found only in the loss of those leaves and in the diminished power of the plant to decompose carbonic acid and produce organic material from it.

5. The metallic oxides and metallic salts adhering to the leaves of plants grown for fodder may be dangerous to animal organisms, by exciting and attacking the membrane lining the bowels, and under very unfavorable circumstances may

even cause death. This fact can always be determined by autopsy and chemical analysis.

6. The assertion that the so-called "acid sickness" (*Säurekrankheit*) which appears among the cattle of the Freiberg region, and also that tubercles are caused by the substances contained in the furnace smoke, lacks even the slightest confirmation, and must be denied in the most decided manner.

The reader will have noticed that Dr. FREYTAG invariably speaks of *appreciable* injury and *evident* injury. The sum of his conclusions is that while furnace smoke may and does injure vegetation, the injury can always be exactly determined by inspecting the crop; just as a farmer can estimate the value of a field of hay or grain which has suffered from smut or any other injury. In like manner, if animals die or are feeble, it can be definitely ascertained in each case whether their troubles arise from eating contaminated hay, or whether they are due to other causes. It is the general idea that the smoke from a smelting works contaminates the whole region around it, and that the owners are bound to make good the injury, which the Professor disputes. He says that each case of injury is a matter for special proof.

This decision is very important to European smelters, though less so to our own. In many cases damages are paid by foreign works to owners of barren land, whose property could not possibly produce crops large enough to sell for the amount of the damages. The villainous arsenical and sulphurous odors evolved from smelting works, especially in former times, were so offensive to human nostrils that they were supposed to be really deadly to plants; and the peculiar reputation which miners and smelters have had in all ages, of making money without effort and without risk, has led law-makers to impose upon them the full burden of all alleged injuries. Investigations like those which we have discussed are likely to turn the scale and make a very important difference in favor of the smelters.

How important the decision of Dr. FREYTAG is may be seen from the fact that in the 16 years, 1855–70, the Freiberg works have paid no less than 172,142 thaler, or $123,942 in gold, for damages claimed on account of the injury caused by smoke. This is not far from $8000 a year, and the maximum was $13,391, paid in 1864. The fact that the maximum should have been paid in that year is itself very remarkable, for it is precisely in 1864 that the Muldner works began to manufacture arsenic, thus removing a part of that deadly element from the smoke; while the same year was signalized at the Halsbrücke works by increasing the manufacture of sulphuric acid from the smoke two-fold over the amount made the year before. No less than 1422 tons of acid were sold in 1864. The previous year, 1863, was in its turn remarkable for the increased make of arsenic at the same works, 379 tons being sold, which was ten times as much as in 1862.

These figures make it evident that the claims for damages do not correspond to the character of the smoke, and it is not surprising to see the allowances for such damages suddenly cut down in 1869 from $9,072 to $2,874, and still further to $1,148 in 1870. Inasmuch as the investigation above spoken of took place in December, 1870, it is quite likely that even these sums have been further lessened in consequence of the conclusions quoted above.

The Tax on Anthracite.

THE proposition before the Pennsylvania Legislature to tax anthracite coal three cents per ton has many advocates as well as much opposition. The Pottsville *Miner's Journal*, the best informed on coal matters of any of the Pennsylvania papers, devotes a good deal of space to the subject, and though opposing the tax, it published a few days ago a letter giving the other side ofthe question. We make some extracts which show one Pennsylvanian view of this case.

The tax on anthracite (it is not proposed to tax bituminous coal), we are told, "is not designed to be a tax on fuel, but upon the great coal monopolies."

"During the seven years of its existence, it has never appeared, nor has it been advocated, that the tax of four cents fell anywhere but upon the companies, and we are unable to see how this proposed tax of three cents can. If it be argued that this tax will fall upon the consumers, then we cannot see how it will particularly affect the people of this State, as we think the great body of anthracite coal mined finds its way into, and is consumed by the citizens of, other States, who, therefore will pay out of their pockets the great bulk of the tax.

"The reason why bituminous coal is not, or should not be, taxed as well as anthracite is, that while the former article, in addition to having to compete with other States and countries, is mined chiefly by individuals or small companies who are already heavily taxed, the latter article is owned and controlled almost entirely by a few wealthy corporations, which, as already explained, can only be reached through this tax or by taxing their real estate, and under the new Constitution their real estate cannot be taxed unless *all real estate* in the Commonwealth shared the same fate."

It is claimed that under the present law the large companies organized under the laws of the States, such as the Delaware and Hudson Canal Company and those having a merely nominal capital stock, their capital being represented by bonds instead of stock, escape taxation to a large extent and that consequently the law acts unequally.

Surely there can be found sufficient legal ability in the Pennsylvania Legislature to devise a means of taxing these companies according to their interests in the State in the same manner as State corporations or individuals, without making an enactment which is of questionable constitutionality, and which, avowedly, is intended to be made unequal (for it is made specially for two or three companies and applies to all), and to tax indirectly the citizens of other States.

It is a well-established principle of Political Economy that the cheap production of the raw materials, which form the foundation of manufactures, should be encouraged, not restricted, and that taxes should be, as far as practicable, imposed only on articles of luxury, directly on the citizens according to their means, and on articles in their last stage of manufacture. And for the simple reason that a tax imposed on the raw material has to be paid over with interest and profits on the investment by every one handling this material, till, finally, the consumer has to pay ten or twenty times as much as the Government receives.

MR. FREDERICK CAZIN, whose excellent one-plunger jig has occasioned so much controversy among our readers, announces himself ready to contract for the re-opening of claims in the western mining districts, that in consequence of long abandonment must fall into the possession of Government in June next, if not worked upon before that date. We presume, without knowing the particulars of Mr. CAZIN's intentions, that this is an opportunity for preserving an interest in claims that are considered valuable, by yielding up a part of property to one who will undertake the necessary cost of re-opening. Mr. CAZIN is an experienced engineer, and will, no doubt, be found just the man of whom many Western miners are in sore want.

NEW PUBLICATIONS.

GEOLOGICAL SURVEY OF MISSOURI; RAPHAEL PUMPELLY.

(CONCLUDED FROM PAGE 136.)

Chapters III., IV., V. and VI. comprise an admirable treatise on the iron-ores and iron-ore deposits of Missouri, by Dr. ADOLPH SCHMIDT. To this elaborate essay we cannot do justice within the limits of the present article. Dr. SCHMIDT divides the principal important iron regions of Missouri, as far as now known, into the eastern region, composed of the southeastern limonite and the Iron Mountain specular ore district, and having as its commercial outlet the Iron Mountain Railroad; the central region, containing principally specular ores, and having as its outlets the St. Louis, Salem and Little Rock, and the Atlantic and Pacific Railroads; and the Western or Osage region of limonites and red hematites, remotely connected with the present ore-markets by the Osage River to Osage City and thence by the Missouri River or the Missouri Pacific Railroad. These regions form a broad ore-belt, crossing the State from the Mississipi to the Osage, or from southeast to northwest, about parallel to the course of the Missouri, the specular ores occupying the middle portion and the limonites both ends. The latter are also spread over the southern half of the State, and the sub-carboniferous hematites occur along the southern border of the north Missouri coal field. This distribution of ores is illustrated in the map contained in the Atlas, which represents about 280 deposits, and indicates by an ingenious graphical system their general characteristics of size, nature, material and condition.

Dr. SCHMIDT describes with considerable detail the ores of each district comprised in the regions enumerated. He shows that the two principal mineralogical species of iron ore, hematite and limonite, are represented in Missouri, and that the hematite occurs in two distinct varieties, as specular ore and as red hematite. The specular occurs either in porphyry or in sandstone; the red hematite forms strata in the carboniferous system; and the limonite is generally deposited on limestone. The condition of the beds gives rise to a further classification, so that, for the purpose of a systematic description, Dr. SCHMIDT presumes the existence of the following eight kinds of deposits:

Deposits of specular ore in porphyry; deposits of specular ore in sandstone; disturbed deposits of specular ore; drifted deposits of specular ore; strata of red hematite; disturbed or drifted deposits of red hematite; deposits of limonite on limestone; and disturbed or drifted deposits of limonite. With regard to the deposits which he calls "drifted," the question appears to be still open whether they are deposits of *débris*, brought from a distance, or of *débris in situ*, constituting mere outlyers of solid bodies in the immediate vicinity.

Dr. SCHMIDT holds that the specular ore deposits have been formed by infiltration from chalybeate waters. At Iron Mountain he believes such waters to have deposited oxide of iron in numerous large and small fissures in the porphyries. At Pilot Knob, he believes the iron ore beds to have been formed by gradual replacement of stratified porphyry with ore, effected by solutions similar to those which caused the Iron Mountain and other deposits. This view is supported by chemical as well as geological considerations.

The deposits of specular ore in sandstone belong to the lower Silurian formation, have generally a lenticular shape, are frequently inclined and sometimes cut off abruptly at the outskirts by nearly vertical walls of clay and sandstone so as to appear like large pockets. Dr. SCHMIDT is unable to decide whether the Silurian masses of ore have been formed by deposition from chalybeate waters in depressions on the surface of the sandstones or whether they have come into existence by gradual replacement of lenticular limestone deposits in sandstone.

With regard to the strata of red hematite of the carboniferous formation, it is impossible to deny that, unlike all other deposits of iron ore in Missouri, they form, in themselves, regular members of the geological series, though apparently not always occupying the same horizon. None of the deposits are as yet sufficiently opened to show conclusively whether the ore was formed directly on the surface of the underlying sandstone or whether it was infiltrated afterwards, gradually removing and replacing beds of limestone, or the more soluble layers of sandstone.

All the undisturbed limonite deposits are found on limestone, but neither in veins, beds, strata, nor lenticular or other pockets of well defined and regular

form. The ore occurs in irregular cracks and cavities on or near the surface of the various limestones. This circumstance, together with the invariable stalactitic structure of the ore, may be taken to prove that it was deposited by infiltrated solutions from above. Its form as a hydrated oxide is undoubtedly due, in part at least, to the chemical influence of the carbonate of lime. Some of the limestone deposits, occurring on sandstone, or imbedded in the sub-soil or other *débris*, are evidently disturbed or drifted. At Matthews Mountain, the ore is associated with porphyry, into the detritus of which it has probably been drifted. Few deposits of this class have been thoroughly opened.

Dr. SCHMIDT gives a carefully arranged table containing the names of 278 iron deposits of the State, their location, ownership, probable character and size, character of ore, and distance from the nearest railroad, or navigable river.

Mr. G. C. BROADHEAD, (since Prof. PUMPELLY's resignation the State Geologist) furnishes a report of the geology of northwestern Missouri, and Prof. W. B. POTTER an account of the geology of Lincoln County. These are principally valuable to the economic geologist as containing a complete account of the coal measures of Missouri, which comprise an area of about 22,995 square miles including 8,406 square miles of upper and barren measures, about 2,000 of exposed middle and 12,420 of exposed lower measures. The aggregate thickness of the upper coal measures is 1,317 feet, including only about 4 feet of coal, of which there are two seams of one foot in thickness, the others being very thin seams or mere streaks. The middle coal measures include a total thickness of about 324 feet, in which are embraced about 7 feet of coal, including two workable seams of 21 and 24 inches; one other of 1 ft., that is worked under favorable circumstances, and six seams too thin to work. The lower measures include from 250 to 300 feet, embracing about five workable seams of coal, varying in thickness from 1½ ft., to 4½ ft, and thin seams varying from 6 to 11 inches, and several minor seams and streaks: in all, 13 ft. 6 inches of coal. We therefore have in Missouri nearly 1,900 ft. of coal measures with a total aggregate of 24 ft. 6 in. of coal. The thinner seams of coal are not often mined, except in localities remote from railroad transportation. The coal from thicker seams (those from 1½ to 2 and 4ft.) is generally sold at ten cents per bushel at the mines.

The thin seam, 10 to 14 inches on Nodaway river, is sold at over 20 cents per bushel at the mines. The reason of this is the difficulty of mining (there being so much superfluous material to be removed) and the remoteness of other coals.

Miners seem to prefer to work a bed of 2ft. to 2 ½ft. in thickness, to even one of greater thickness. Mr BROADHEAD considers all beds over 18 in. thick as workable coals. The estimated area, where such may be reached within two hundred feet from the surface, is about 7,000 square miles.

Mr. BROADHEAD gives a schedule showing the depth of coal seams below given horizons, as a guide for boring after coal.

The report of CHARLES A. SMITH, on the strength of building materials, shows the character, in this respect, of the granites, sandstones, limestones, concretes and bricks produced in Missouri.

This volume is published in very handsome style by JULIUS BIEN, New York, who also produces the magnificent atlas which accompanies it. We must not omit to express our satisfaction with the excellent analytical index which largely increases the value of the work. It is subject for regret that Mr. PUMPELLY, whose ability as Director is witnessed by this well-planned and well executed work, has been compelled by ill health to resign his position.

CORRESPONDENCE.

Cheap Drills for Poor Men.

GOLD HILL, Boulder Co., Colorado, February 1, 1874.

TO THE EDITOR—Sir: Since 1859 I have been engaged in opening mines in this part of the country, and therefore feel at liberty to write you in regard to one of the wants of this region. It is a cheap and effective machine drill to take the place of the ordinary hand-drill which, heretofore, has been the sole dependence of the miner. Generally two men work at one drill, at a cost of $3 or $4 per day for each man. I made a four-lip drill in 1863, with a die and swedge for repairs, which cost me $14 at the shop in Central. I let the foreman of the Gunnel lode use it a few days, but he made an indifferent report of its action, averring it would cost too much to keep it in repairs. I have reasons to think that BURLEIGH got his drill from that pattern, at that time. I also learn that gentleman asks $13,000 for a set of his machinery suitable for use in one of our mining tunnels of 7×8 ft. size. Now, if his machine could be furnished for $1300 it would be still too high by one-half, to come into general use in mining operations.

What the cost of the diamond drill apparatus is, or who the makers and patentees are, is what I would like to have you furnish me information of. I have a drawing and description of it, copied from a number of your JOURNAL, several years ago. I think I could make some improvements on it, by making it light enough to run by hand power, so it could be furnished for a few hundred dollars cost, at most, and be quite as effective as it is now, when driven by air or steam. If you have the opportunity to pass this notice to them for me, you will much oblige by doing so. Every mining company running more than half-a-dozen hands wants such a machine badly, and some of them could and would use several, if they could be furnished for something like $500 each; I believe they can be.

The machine ought not to weigh much over 100 lb., and should be as small as two cubic feet or thereabouts; should be mounted on small trucks and furnished with slender jack-screws on the sides and top to keep it in place. I think I could double its boring capacity with the same power now used, and if properly geared to a hand power so as to get up the required velocity and power to make a hole of 1 inch or 1¼ inch diameter, and not to exceed the before-mentioned cost, it would be greatly sought after in all mining countries, and soon come into general use, to the great advantage of the manufacturers as well as the operators, and reduce the cost of our excavations from present prices of $15 to $40 per linear foot, fully one-half. J. A. HITCHINGS.

We doubt if a machine drill can be made so light as 100 lb. without sacrificing strength. Certainly no percussion drill can be made so light. On the other hand no diamond drill can be made for $500. Nevertheless, our correspondent's letter is a fair expression of what is really a very common belief among practical miners, namely, that a machine drill can be made which will be light enough for one man to handle and cheap enough for a miner to buy. Such a machine might not do as good work as the present kind, but would be more effective than hand labor. As to the drill with an X face made by our correspondent, we hardly think he has any claim against Mr. BURLEIGH, for that is a very old form of drill and was invented before the word "invention" was known. ED.

Notes on Smelting at Golden.

Late last fall, Mr. WEST, of the Golden Smelting Works, noticed in the products from his blast furnace, a layer of yellowish matte lying above the metallic lead and below the copper matte. On examination in the laboratory it proved to be nickel speiss, which is a composition of nickel, copper and sulphur. Mr. WEST immediately added a percentage of antimonial pyrites to the mixture of his ores, and the result has been that since that time a layer of speiss, varying between ¼ and ½ an inch in thickness has steadily been run out with the metallic products of his furnace.

The ores from which this is derived are the iron and copper pyrites of Gilpin County, and it now has been fully established that from ¼ to ½ per cent. of nickel may be found in a large number of mines. In ordinary parlance this amounts to between 80 and 160 ounces avoirdupois to the ton, and as the metal is worth about $4 per pound, the discovery is of no small importance. Mr. WEST also finds a small quantity of cobalt with the nickel, but the greater cost of reducing and separating that metal, together with the fact that it is present in so small a percentage, will render it impossible to produce it profitably, for the present, at least.

Up to date about 800 pounds of speiss have been produced and the amount is increasing daily. This material contains about 37 per cent. of nickel, and will probably be sent away for separation, as the small amount so far obtained does not warrant the erection of the necessary apparatus. The process of separation is, however, not a difficult one, and Mr. WEST is prepared to carry it out as soon as it may be deemed advisable by him.

The metallurgical progress made during 1873 at the Golden Smelting Works is more than is generally apprehended. In his superintendency of that establishment, Mr. WEST has proved himself a thorough master of his business, and though the works have not produced large amounts of gold and silver during the year, they are, in our opinion, the most successful in Colorado. At this day in our history we should not always gauge the success of a smelting works by the number of pounds of precious metal turned out per week. The numerous other metals contained in our ores have introduced another element which, fortunately for the country, is being carefully considered. Mr. WEST is now in an establishment whose total cost will not reach $25,000, producing *at a profit* five metals in the native condition, viz., gold, silver, copper, lead and zinc, and in addition to this, a fair quantity of the nickel speiss. Thirteen thousand dollars worth of lead, so pure that it is in demand for the production of paint in St. Louis; nearly four thousand dollars worth of metallic copper, and the amount of gold and silver credited to the works in our general summary, is but one result of the year's work. The copper separating branch of the establishment, together with the zinc and nickel production, have only been inaugurated within a few months, and therefore do not appear so large as they will in the future. But what we regard as by far the most important work of Mr. WEST's administration, is the success he has met in using the valley lignites in roasting and smelting. As is probably known, the ordinary fire box was first used and then a step grate, but neither would answer the purpose. A Siemens' regenerator was then tried, but as the coal carried from 10 to 16 per cent. of water it did not meet all the requirements. A new method was then immediately tested, which is the invention of the manager, by which heat enough to carry on a perfect roasting and smelting in a 60-foot furnace is obtained, and any kind of coal not absolutely drenched with water can be used as well for the purpose as a dry bituminous.

With such substantial results before us, it is impossible to look at the condition of the smelting industry in our midst without self-congratulations over the year's work. The process inaugurated by Mr. WEST, and in use at the Golden Smelting Works, has proved to be not only applicable to every class of ore at present mined, but is the only one that will allow of the treatment of the low grade lead ores which are so abundant in numerous parts of the Territory. Colorado has heretofore lived off the cream of its mines. It has now been demonstrated that the ores which will ultimately be the bulk of our resources, and which have hitherto laid untouched—the 20 to 50 ounce ores carrying 30 to 60 per cent. of lead—can be mined and smelted at a profit to both miner and mill-man.—*Colorado Mining Review.*

ABOLISHMENT OF VERTICAL LADDERS IN THE CORNISH MINES.—Another expense is about to be thrown on Cornish mines under the Mines Regulation Act. Mr. LE NEVE FOSTER, the Government inspector, has given notice to the managers of Cornish mines to comply with the Act, and and remove their vertical ladders and put them "on the lay." This is an alteration which will prove a great boon to the working miners. It is a terrible task for a man to climb up vertical ladders, sometimes from 180 to 260 fathoms deep, after working, perhaps in bad air for eight hours. The climbing of these ladders has given the miners a peculiar complaint in the lungs, unknown to miners who ascend and descend in any other way.

THE SCOTCH IRON MARKET.

GLASGOW, Feb. 14, 1874.

Since our last report there has been a very marked decline in the warrant market, and prices have again fallen several shillings. They are now below 100s., which they have not been for several months. The decrease in shipments since December 25, 1873, is 22,516 tons. The imports of Middlesborough pig iron into Grangemouth have increased this year over the same time in 1873 by 6,904 tons. No. 1 Gartsherrie is quoted at 112s. 6d., and Coltness at 115s.

THE BRITISH IRON TRADE.

LONDON, Feb 14, 1874.

Northumberland, Durham and Cleveland.—From New-Castle-upon-Tyne we learn that in manufactured irons there is not much doing. Some of the mills in the immediate neighborhood are commencing to roll rails, for which contracts have been made. Pig iron is considerably easier in price. The scotch market having lowered prices 5s. to 6s. per ton, is having a depressing effect on the market here. Forge iron has been sold at 74s. to 78s. per ton, but chiefly through merchants, the makers being firm in their price, having well sold forward. No. 1 is quoted at 95s., and No. 3 at about 87s. per ton. Our reports from *Middlesbrough-on-Tees* show that the market is flat, No. 3 pig being quoted at 82s. per ton. Considering the increase in makers' stocks, it is only reasonable to suppose that there will be a further decline. The finished iron trade is improving; several good rail orders have been secured by Cleveland firms. Most of the works are now fully occupied, and from the number of inquiries arriving by every post, it is believed there will be sufficient work to keep the district well employed for the whole year. Advices from *Darlington* show that trade for the week past has been very dull. There have been few or no inquiries for either pig metal or finished iron. There is a decline in pig iron. No. 3 is usually quoted at 82s. 6d., but iron of that quality has been offered at 80s., whilst forge is from 77s. 6d. to 78s., net cash.

Yorkshire and Derbyshire.—From *Barnsley* we learn that the iron trade is still good, and puddlers, millmen, engineers, and foundry men are all well employed. Some very fair orders are being worked out for light rails. Bessemer rails and forgings appear to be in very fair request at *Sheffield*. At the Elsecar works there has been considerable activity in light rails, but the men do not appear to work well together, as the contractors who have men under them are said to have monopolized the whole of the advance made during the last year. The largest of the mills, especially those engaged in the armor and plate trade, are uncommonly active, orders being executed not alone for this country, but for the majority of the European Powers who are constructing iron-clads.

Lancashire and Cheshire.—Reports from *Manchester* show that during the last week the iron trade has been exceedingly dull, and prices have, in consequence, somewhat declined, and the tendency of the market is downward. The iron works are at present pretty fully employed, but it is very probable that unless the demand shortly improves the working hours will be curtailed. No. 3 foundry iron is quoted at 92s. to 93s. 6d. Rails are quoted at £10 12s. 6d.

South Staffordshire, East Worcestershire and Warwickshire.—From *Wolverhampton* we learn the iron trade of that district is only moderately active, and the majority of mills and forges continue in partial operation. Pig iron of good brands is firm at £7 to £7 10s. for all mine; £5 10s. to £6 for part mine; but commoner brands show some weakness. There seems to be but little doubt that many orders for finished iron are in the market, but are being withheld in the hope of lower quotations shortly being declared. For the present the prospect of a reduction in price is not very hopeful, for it must be preceded by the declaration of a lower rate for fuel, and local coal is strong, although some distant samples show signs of weakness. Limestone has advanced 6d. per ton. Reports from *Birmingham* show that stocks are low, and it is generally believed that a brisk demand will succeed the late depression. The principal firms are well supplied with orders. There is not much demand for pigs. All mine hot-blast pigs are quoted at from £7 2s. 6d. to £7 7s. 6d.; part mine at £6 to £6 5s., and common cinder pigs, £4 7s. 6d. to £4 12s. 6d. At *Dudley* the demand for pig iron continues good, especially for the best brands, and prices remain unchanged. All mine hot blast is quoted at £7 to £7 10s., and cold blast, £8 to £8 10s. per ton. There still remains a large number of furnaces out of blast, owing to the dearness of fuel and scarcity of iron ore.

Monmouthshire and South Wales.—From *Newport* we learn that there is no appreciable movement in the iron trade. A few days ago there was an appearance of a better inquiry, but it has not been followed up by the placing of orders, as it was hoped. All connected with the trade have been so mixed up with the elections that business has, for a brief period, almost been lost sight of. Quotations for all classes of iron remain about the same, but the prevailing tendency is, no doubt, toward a reduction. At *Swansea* the feeling is pretty general that the iron business in all branches will be healthy and active during the ensuing Spring and Summer months, but there are no outward visible signs to warrant this belief. The orders which have lately come to hand have been altogether insignificant, both as to number and extent, and consequently prices have not shown any tendency to advance. The chief works in this district are kept going, and the men are employed quite as fully as their inclination induces them to work. There is no change to note at *Cardiff*. It is confidently expected, however, that some improvement will take place shortly. The total quantity of iron exported from there during the month of January was 9,259 tons, which was less than half the average. At *Merthyr Tydvil* there is little doing in anything beyond immediate requirements. Most works, however, hold a few orders, which help to keep things going.

THE BRITISH COAL TRADE.

LONDON, Feb. 14, 1874.

Owing to the present cold weather there has been a slight increase in the price of house coals, but it is impossible to hold it, as the stocks are too large. A review of the markets show that there has been a general decline in all grades except house coals, and it is felt that the production has fully met the demand. The indications are of a further downward tendency in prices, which will no doubt be the case, if the reduction in wages, which must take place, does not stop many collieries. In the few cases where a reduction has been attempted, the workmen have made but feeble resistance, and finally accepted the operators' terms.

From *Newcastle-upon-Tyne* we learn that there is a continued absence of demand for house and steam coals, and some of the pits are either idle or "teeming to heap." Last week the price of house coals was reduced 2s. 6d., and it is thought the general market will be easier. The coke trade is flat. Good quality can be bought at 28s. per ton at the ovens, and inferior sorts at 23s. to 24s. Advices from *Middlesbrough-on-Tees* state that in the coal and coke trades there is nothing calling for special remark. There is a plentiful supply of fuel, and prices are easier. From *Darlington* we learn that rates remain unaltered, and there has been a steady business, though the slackness at the ports has largely continued. Coal, which a few weeks since commanded 20s. at the pit, is now on sale at 18s. to 18s. 6d., whilst the superior kinds, usually reserved for the London market, which were standing at 22s., can be bought for 20s. The rates of manufacturing coal remain about the same. First quality of coke commands 29s. to 30s. at the ovens; second quality, 27s. to 28s.; and third quality as low as 25s. At *Barnsley* prices have fallen considerably, and there is a prospect of a still greater reduction. The productive power of the district is rapidly increasing, and this must tend to keep prices down. Steam coal is not so brisk as it has been, and prices have been reduced 1s. per ton, so that the best "hards" can now be purchased at 18s. per ton. The operators see the necessity of a reduction in wages, which they feel will be met by the men with the offer to work three or four days a week in preference, which proposition is not likely to be entertained by the operators. From *Sheffield* we learn that the coal trade throughout that district is far from brisk. At the collieries sending to London there has not been so much doing as might have been expected for February, and some surprise has been manifested at the rise in price, which took place on Wednesday in the metropolis, when hundreds of wagons were to be seen standing unloaded in nearly all directions for want of custom. Advices from *Manchester* show that the demand for house coals is only moderate. Consumers laid in large stocks toward the end of last year, and as the Winter has been very mild, it has a decided effect on the market at the present moment. The demand for steam and furnace varieties is steady, but the competition among sellers is very keen, and considerable underselling, especially among the proprietors of small collieries, is the result. There are rumors of contemplated reductions in miners' wages. At *Liverpool* there is no material change to note. Supplies are in moderate quantities, but not in excess of the demand. Shipments, coastwise, are much below the average. At *Dudley* the stocks are short, and the demand continues large. Best thick coal is quoted at 23s.; common, 18s. 6d.; and slack, 9s. per ton, into trucks, boats, and carts at the pit mouth. At *Forest of Dean* business is dull, which is partly accounted for by the mildness of the season on the one hand, and the high price, which is still quoted, on the other hand. The *Severn* traffic is particularly inactive, and has been for some time past. From *Swansea* we learn that the coal trade is still active, and every ton which can be raised finds a ready market at good prices. At *Cardiff* there is not much change to note. The inquiries have been more pressing, owing to the diminished supply from the collieries— which have not been working full. Quotations for steam qualities are unaltered. Best steam is quoted at 21s. to 22s. 6d., and best house at 19s.

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In preparing the present edition for the press, it has accordingly been the aim of the editors to bring down the information to the latest possible dates, and to furnish an accurate account of the most recent discoveries in science, of every fresh production in literature, and of the newest inventions in the practical arts, as well as to give a succinct and original record of the progress of political and historical events.

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OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. A few copies of the first volume of the transactions have been reserved by the Council for purposes of exchanges, etc., with libraries, scientific societies, or technical journals. The lists for these objects are now in course of preparation. Professor THOMAS EGLESTON, of the School of Mines, Columbia College, New York City, has charge of the list of foreign periodicals and professional societies, to which copies of the Transactions should be sent; Professor F. PRIME, Jr., Lafayette College, Easton, Pa., has the list of technical and public libraries in this country, and Mr. RAYMOND that of American periodicals and professional societies. Each of these gentlemen desires suggestions from members of the Institute; and from the names suggested the final lists will be made up, governing the distribution of free copies of the Transactions.

IV. The Council earnestly requests members to forward to the Secretary, for preservation, copies of all printed mining and geological reports, particularly pamphlets, which may fall in their way. It is believed that by this means a large amount of valuable fugitive information concerning different regions and properties in this country, may be caught and preserved.

V. According to the Fourth Rule of the Institute, the Vice Presidents and Managers have classified themselves by lot, with the following result:

Vice Presidents: Messrs. ROTHWELL, PECHIN and BLANDY retire May, 1874; Messrs. COXE, EGLESTON and BLAKE retire May, 1875.

Managers: Messrs. PETTEE, PRIME and FIRMSTONE retire May, 1874; Messrs. MAYNARD, SYMONS and LESLEY retire May, 1875; Messrs. CORYELL, HEWITT and HUNT retire May, 1876.

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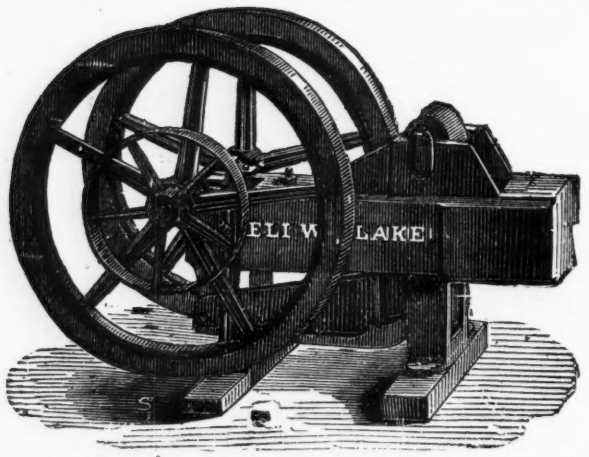

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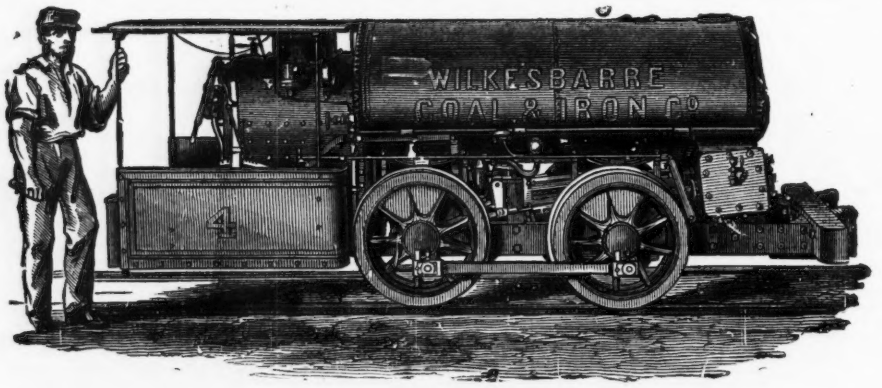

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